Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
PRINTING
FINISHING

UST 28, 1944
ME 33, No. 18

AMERICAN
DYESTUFF REPORTER

UNIVERSITY OF NEBRASKA AGRICULTURAL LIBRARY SEP 13 1944

Few are faster to light

Few Reds, even in the Chrome Color group, are faster to light than the new, slower drawing Polar Red R L.

Rating "6" (8 is tops) and with brightness comparable with the older and highly regarded Polar Reds—Polar Red R L opens new opportunities on woolens and union fabrics where light fastness is supremely important.

Polar Red R L . . .

1. When used in combination with Polar Yellow 2 G Conc. or 5 G Conc. and Polar Brilliant Blue R A W (in any stage of woolen manufacture) gives Mode shades of excellent fastness.
2. Dyes efficiently in a neutral bath, making it extremely interesting for union automobile and upholstery fabrics demanding real light fastness.
3. Can also be dyed in combination with Chrome Colors.

A booklet is available illustrating Polar Red R L, its properties and its effects on extraneous fibres.

GEIGY COMPANY INC.

89-91 BARCLAY STREET — NEW YORK—NEW YORK

Boston · Providence
Philadelphia · Charlotte
Toronto · Portland, Ore.

Geigy
Dyestuff Makers Since 1859

In Great Britain
The Geigy Colour Co., Ltd.
National Buildings
Parsonage, Manchester

AATCC
IAL PUBLICATION
of the
ROCEEDINGS
CAN ASSOCIATION
EXTILE CHEMISTS
ID COLORISTS

Use DECERESOL* OT

THE MOST POWERFUL WETTING AGENT AVAILABLE

CUTS TIME AND COSTS IN MORE THAN THIRTY DIFFERENT WETTING, EMULSIFYING AND DISPERSING OPERATIONS

Making one month do the work of two is a feat that has been accomplished over and over again by many textile mills through the use of DECERESOL OT. Here is a partial list of applications:

Wetting out cotton piece goods prior to "grey souring."

Wetting out raw cotton in raw stock dyeing machines.

As a penetrant in all types of dyeing including yarn and knitted and woven goods.

As a dispersing agent in the pigment method of vat dyeing.

For rapid wetting out in sanforizing.

For wetting out grey goods prior to kier boiling to insure more uniform boil off and to prevent resist marks in subsequent dyeing.

As a dispersing agent in dyestuff mixtures to insure better solubility and to improve color value.

As a dispersing agent for finishing oils to obtain greater softening value.

In desizing baths with enzymes to produce more rapid and efficient desizing.

For boiling off rayons and acetates.

In the woolen and worsted industry as an aid in fulling and carbonizing.

For dyeing Nylon and Vinyon yarns, hosiery, etc.

For the production of highly absorbent products such as mop yarns, paper mill felts, towels and similar fabrics.

Our representative will gladly give you more detailed information on the DECERESOL *Wetting Agents and help you select the type or types best suited to your operations.*

AMERICAN CYANAMID
& CHEMICAL CORPORATION
(A Unit of American Cyanamid Company)
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

MANUFACTURERS OF
SULPHONATED OILS • PENETRANTS • SOFTENERS
FINISHES • SIZING COMPOUNDS

*Reg. U. S. Pat. Off.

American Dyestuff Reporter, Vol. 33, No. 18. August 28, 1944. Published every other Monday. Copyright 1944, by Howes Publishing Co., 440 4th Ave., New York, 16, N. Y. Domestic subscriptions, $5.00; Canadian, $6.00; Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

What...

IS THE LIGHT FASTNESS AFTER *UREA FORMALDEHYDE* RESIN FINISHING ?

THIS is One Of The Questions Constantly Confronting The Dyer of Spun Rayon Fabrics.

In this booklet it is answered . . . by fastness ratings in Fadeometer Hours, on dyeings of each color in a complete series of Direct and Developed Colors—*before* and *after* finishing. This indicates in the clearest possible way the colors that are comparatively unaffected, those that are improved, *and* those whose light fastness is impaired . . . Other ratings show the effect on strength and shade.

From these colors, that find the widest application to spun rayons, this booklet will help you select the best ones to meet your requirements.

•

ASK OUR REPRESENTATIVE
OR WRITE FOR YOUR COPY

•

DYESTUFFS • CHEMICALS • INTERMEDIATES
CIBA
INC.
Greenwich & Morton Sts.
NEW YORK
BOSTON · CHICAGO · MONTREAL · CHARLOTTE
PROVIDENCE · SAN FRANCISCO · PHILADELPHIA
VAT DYES OF THE DOW CHEMICAL COMPANY

G.I. NOW... but just wait

The Invasion is on!

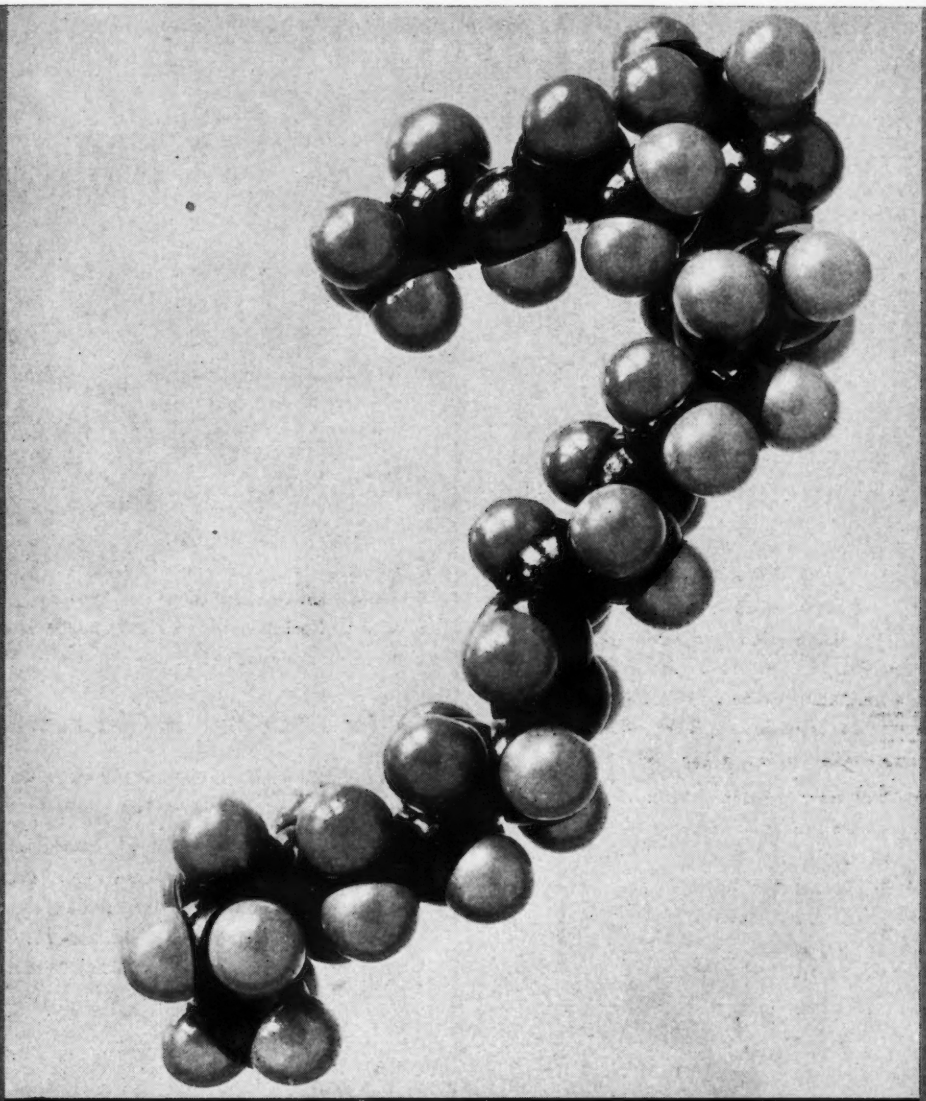
Out of the sky float myriads of vari-colored supply parachutes, dropping food, ammunition, guns, all the sinews of war. And those parachutes are made of rayon—the very same rayon that might have gone into your linings and undies, dresses and gowns.

We at Industrial are proud that the quality of our famous "Continuous Process" *Spun-lo Yarn—its uniformity, strength and knot-free characteristics —recommended it to Uncle Sam's technicians for such vital tasks. They're the very same characteristics that recommend it so highly for the products of peace. When peace comes, *Spun-lo will be mustered out, and then, lovely fabrics for you—some familiar, some as yet, unborn!

*Reg. U. S. Pat. Off.

Industrial RAYON CORPORATION
MAKERS OF
Spun-lo RAYON YARN
BY THE Continuous Process

CLEVELAND, OHIO · NEW YORK OFFICE: 500 FIFTH AVENUE



A constituent of Onyxsan
2-(8-heptadecenyl) N-acetamidoethyl imidazoline

THE ONYXSAN MOLECULE . . .

The model above represents a constituent of Onyxsan enlarged approximately 60,000,000 times. It also represents the culmination of long painstaking research which included synthesizing and evaluating a great many chemical compounds before the most effective arrangements of atoms was obtained. From this research came a complete line of Onyxsan cationic finishing agents whose superiority for special applications has been fully recognized by the textile industry.

Your inquiries are solicited.

ONYX OIL & CHEMICAL COMPANY

JERSEY CITY, N. J.

PROVIDENCE · CHARLOTTE · CHICAGO · LOS ANGELES · MONTREAL · TORONTO

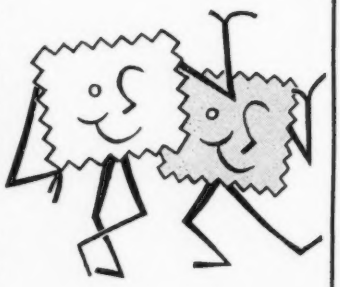
Vandam-Hampton Introduce Two "Green Light" Fabrics—"Crown" Tested for Men's Sportswear

No. 32 of a series—from our files on the new "CROWN" Tested Plan

YES, these two new spun rayon and cotton fabrics have the answers for men's sportswear . . . and they have the green CROWN* Tested Tag as evidence!

Both these cloths . . . a plain-weave called "Alvaray," and a twill-type called "Excelwear" . . . were developed by A. H. Vandam. Both were expertly woven and constructed. And both were beautifully finished at The Hampton Company. From beginning to end, this converter worked for the characteristics most desirable in men's sportswear. And they came up with two fine, durable fabrics . . . truly washable, resistant to fading, resistant to perspiration-staining, Sanforized for shrinkage control.

No wonder Vandam wanted to measure in advance . . . and dramatize...the performance of two fabrics like that! So "Alvaray" and "Excelwear" were brought to us for CROWN Testing. And just as you'd expect, they met every requirement for men's sportswear . . . the very first time.



Here's a partial list of those requirements. Read them over . . . and you'll see why these new fabrics offer so much in the way of satisfactory service.

Laundering temperature . 160° F.
Tensile Strength . . . . . 50 lbs.
Resistance to sunfading 40 hrs. Fadeometer
Resistance to perspiration Acid & Alkaline

May we show how you, too, can use the CROWN Tested Plan...as a prediction of better fabric performance . . . as a builder of consumer confidence, for today and tomorrow?

For a New High in Color Performance . . .

As a new low in finishing time and effort, we offer the facilities of our Dyestuff Research Laboratory.

This new service gives CROWN Tested licensees these three time-saving, trouble-saving advantages. First . . . scientifically accurate dye formulas which simultaneously meet CROWN Tested standards and clients' color needs. Second . . . testing of these formulas under actual plant conditions. Third . . . the consulting services of expert technicians.

Located right here in New York City, the Dyestuff Research Laboratory is available at all times to all CROWN Tested converters and finishers. Come in and talk over the details with us at your convenience.

New Informative Labeling

CONSUMER SATISFACTION UNDER THE THREE TAG SYSTEM

"Crown" Tested Rayon Fabric

A better way to buy rayon fabrics—This identification is awarded only to fabrics containing CROWN Rayon, after they have passed the CROWN Tests for serviceability. These tests predict the fabric will not change visibly in color or in texture, nor in size more than 2%, if instructions are followed. Samples of every dye lot of fabric have been tested against minimum requirements set and maintained by

AMERICAN VISCOSE CORPORATION

Producer of CROWN *Rayon Yarns and Staple Fibers*

Sales Offices: 350 Fifth Avenue, N. Y. C. 1; Providence, R. I.; Charlotte, N. C.; Philadelphia, Pa.

*Reg. U. S. Pat. Off.

"The tide has turned and free men of the world are marching together to victory."

GENERAL DYESTUFF CORPORATION

GDC DYESTUFFS ARE IN SERVICE ALL OVER THE WORLD

AQUA-PERM *Series*

Experience gained through years of research and careful manufacture enables the Aqua-Sec Corporation to present a complete line of durable resin finishes for spun rayons.

AQUA-PERM SF

A durable resin finish to impart a full crisp hand for all spun rayon combinations. No after treatments required.

AQUA-PERM SF Special

A durable resin finish which imparts a full scroopy hand to spun rayons.

AQUA-PERM D
(ODORLESS)

A durable resin finish for crease-proofing . . . eliminates objectionable formaldehyde odor during processing.

AQUA-PERM L

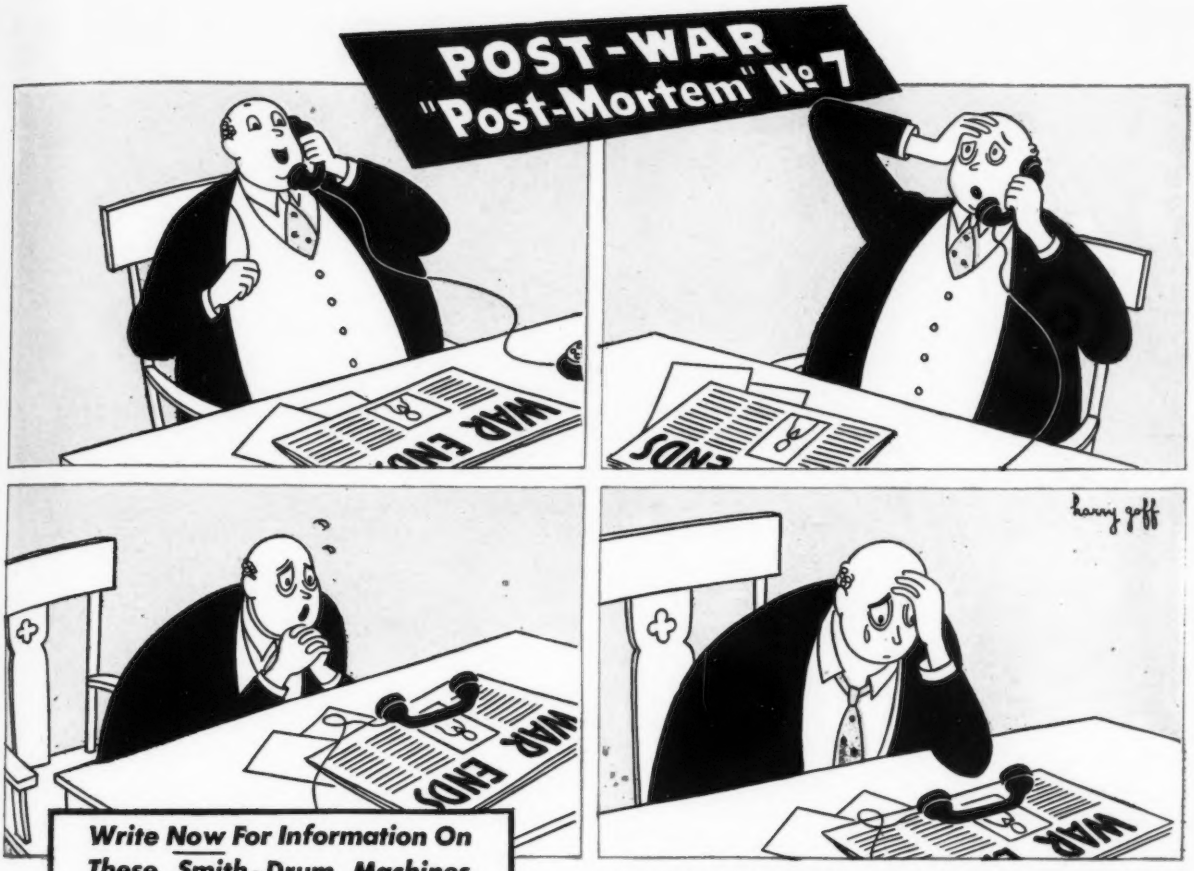
A liquid resin used whenever body and fullness is desired . . . can be used alone or with other Aqua Perm resins.

FOR COMPLETE INFORMATION . . .

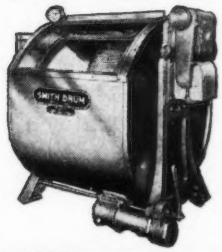
AQUA-SEC CORPORATION

1450 BROADWAY NEW YORK 18, N. Y.

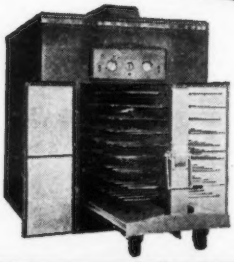
AQUA-SEC processed WATER REPELLENT SPOT RESISTANT PERSPIRATION RESISTANT



Write Now For Information On These Smith-Drum Machines



Rotary Hosiery Dyeing Machines



New Skein Dyeing Machine

New Package Drying Machine

MINUTE MOVIE OF A MAN ORDERING NEW PRODUCTION MACHINES *AFTER* THE WAR IS OVER

Many a textile manufacturer who waits until the war is over to order new machines is going to be *"sadder but wiser."* Because it's going to be tough to get *"what* you want *when* you want it" . . . and there's no doubt about it.

During the war, textile machines have been worn out at a faster rate than ever before in history . . . and scarcely a single new machine has been built! That adds up to just one crystal-clear fact . . . *there's going to be a demand for new machines after the war that will far exceed the machinery manufacturers' capacity to produce it in any reasonable length of time.*

So don't be left "holding the bag" with worn-out, obsolete equipment that you can't replace. Decide *right now* what new machines you are going to need and *place your orders!* That goes for *all* types of machines . . . not just the types we make.

If you *are* going to need new dyeing or finishing machines, our "Post-War Purchase Plan" will be of great interest to you. A letter or a telephone call will bring you complete details, without the slightest obligation.

SMITH, DRUM & COMPANY
Allegheny Avenue at 5th Street, Philadelphia 33, Pa.

SMITH-DRUM TEXTILE MACHINES

for hosiery dyeing, skein dyeing, package dyeing, beam dyeing, piece goods dyeing, package drying, skein mercerizing, warp mercerizing, hosiery inspection.

Quick as a Wink

NOPCO 2272-C WETS OUT FAST!

Recent tests, made under actual mill conditions, show that NOPCO 2272-C is one of the best performing wetting agents within its price range.

COMPARE NOPCO 2272-C with any wetting agent you now use — or have ever used — for:

1. **SPEED in WETTING OUT and RE-WETTING at low concentrations and wide temperature range. Especially good for use in sanforizing.**
2. **CONSISTENT ABILITY in keeping Production UNIFORMLY FAST and Product Quality UNIFORMLY GOOD.**
3. **IT'S a really good wetting out penetrant for pad and pigment dyeing.**
4. **STABLE in caustic solutions of 3½ to 4%. WHAT'S MORE — It's inexpensive — 15½c per pound.**
5. **ALL OTHER ADVANTAGES expected of a high grade Wetting Agent.**

NOPCO
2272-C
A BETTER WETTING AGENT

Make this test at *our* expense. Send for free sample for actual plant test. Compare it with one you are using. We believe you'll agree that in NOPCO 2272-C we've developed the best wetting agent — dollar for dollar.

NOPCO "EVOLVED THRU RESEARCH"

NATIONAL OIL PRODUCTS COMPANY

Boston • Cedartown, Ga. **HARRISON, N. J.** Chicago • Richmond, Cal.

Through the Gateway to the South

from our plant at Charleston, West Virginia, WESTVACO TEXTILE-GRADE CAUSTIC SODA is being speeded to an ever-increasing number of Southern mills and bleacheries.

Uniform in analysis, car after car, WESTVACO TEXTILE-GRADE CAUSTIC SODA gives excellent, low-cost results in wet processing.

Throughout 1944 we confidently expect to continue to provide Westvaco caustic soda users in the Southern Textile Industry with their full requirements, both as to quality and quantity.

Westvaco Textile-Grade Caustic Soda

Uniformly High Quality from
a Conveniently Nearby Source

Liquid · Flake · Solid

WESTVACO CHLORINE PRODUCTS CORP.

Chrysler Building, New York 17, N. Y.
Woodside Building, Greenville, S. C.
Chicago, Ill., Newark, Calif.

Westvaco
CHEMICALS

STANDARDIZE YOUR PRODUCTION WITH STANDARD CHEMICAL PRODUCTS
USE STANTEX AND STANDOPAL OILS FOR SPINNING, CONING, SIZING, DYEING AND FINISHING

• • • and to guarantee our American way of life, buy an extra War Bond today. Buy more than before • • • it's for Invasion • • • it's for Victory.

S C.P.Inc
REG. U. S. PAT. OFF.

STANDARD CHEMICAL PRODUCTS, Inc.

HIGH POINT, N. C.
CHATTANOOGA, TENN.
PROVIDENCE, R. I.

13th and JEFFERSON STREETS, HOBOKEN, NEW JERSEY

ANDOVER, MASS.
PATERSON, N. J.
SACRAMENTO, CAL.

POLYETHYLENE

—A Carbide Production Achievement for the Navy

Important New Plastic Has Many Unusual Properties

A little over two years ago, the U. S. Navy learned that the Carbide and Carbon Chemicals Corporation in collaboration with an associate company, The Linde Air Products Company, had developed a high pressure synthesis of a new material, Polyethylene, and it was found that this material was exactly suited to meet the Navy's requirements of an insulation for coaxial cable used in radar equipment.

At the Navy's request, these two companies, working together but entirely independent of anyone else, designed in their own Engineering Department, and built with their own Construction Organization a plant to produce polyethylene by a process different from any other commercial polyethylene process.

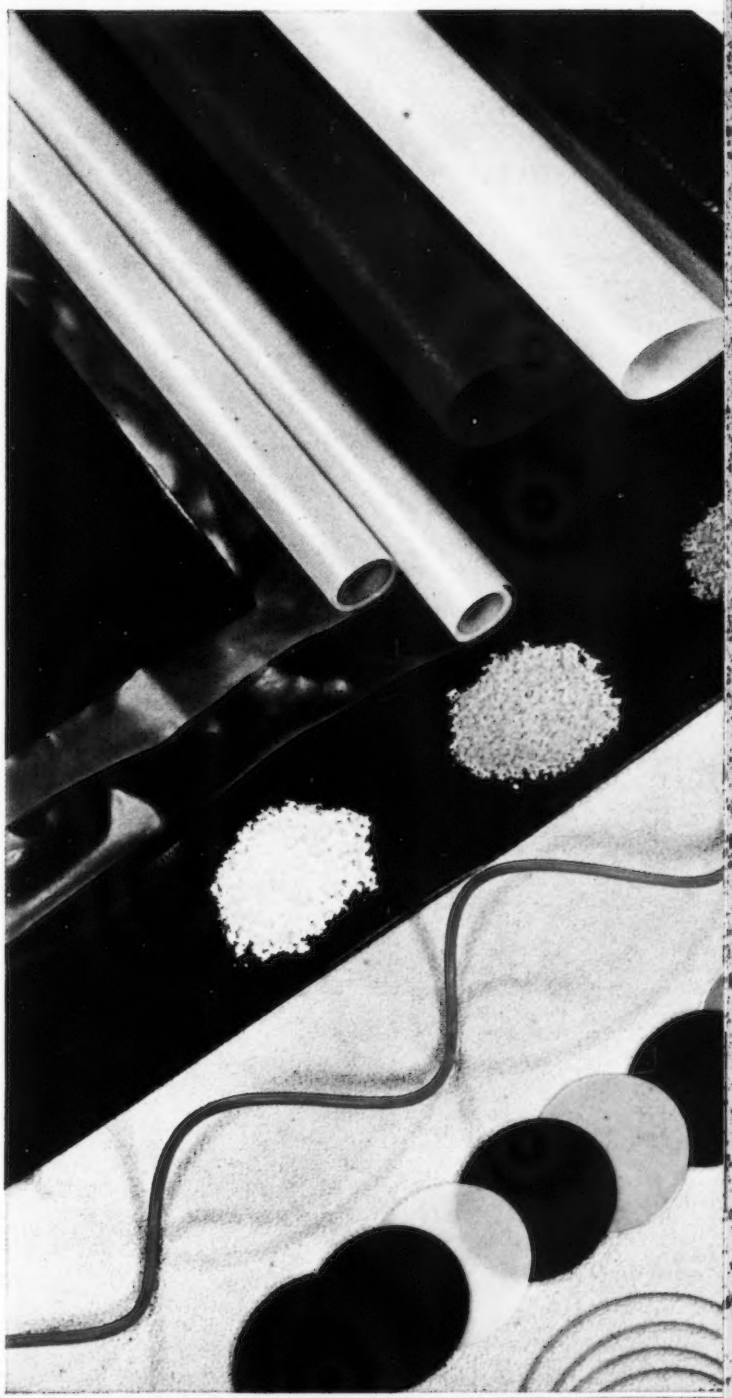
Within thirteen months from the date the project was authorized, this plant was producing at 180 per cent of rated capacity.

At the conclusion of the first full year of production the Navy Department told the plant:

"One year ago your plant commenced the production of polyethylene, a component of radio cable essential to the efficiency of electronic communications units and, therefore, vital to the success of naval operations. Production for the year has equalled 240 per cent of the rated output for the facilities. Everyone engaged in developing the product, planning, engineering, and managing the plant, and each of you engaged in producing polyethylene may be justly proud of a valuable contribution to the war effort."

Today, approximately two years after Carbide was given the assignment, this plant is producing polyethylene at 600 per cent of rated capacity and is providing the Navy's requirements of this material for use in coaxial cable.

(This advertisement has been reviewed and approved by the U. S. Navy Department)



Plastics Division

CARBIDE AND CARBON CHEMICALS CORPORATION

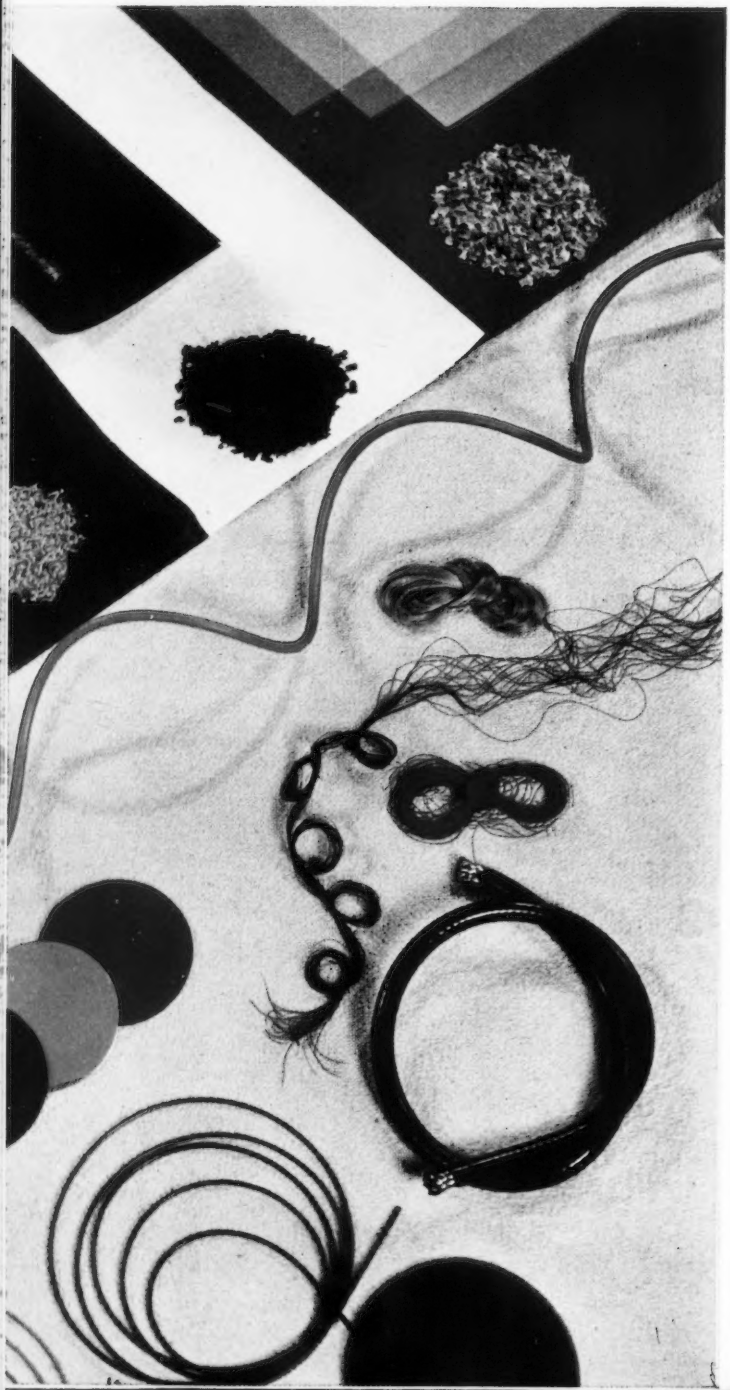
Unit of Union Carbide and Carbon Corporation

UCC

30 EAST 42nd STREET, NEW YORK 17, N.Y.

POLYETHYLENE

—A Carbide Production Achievement for the Navy



The Important New Plastic!

Polyethylene resins have the most favorable electrical characteristics of any plastic material for use in this electronic application. In addition, this new plastic material has many other exceptional characteristics, which suggest widespread application in many different fields. Polyethylene plastics are tough and impact-resistant. They are inherently flexible and extensible. They have an extremely low water vapor transmission coefficient and will absorb an unusually low percentage of water. Their chemical resistance is outstanding. Polyethylene is one of the lightest plastics, so light that it will float in water. It maintains its valuable properties over a wide range of temperature. It remains usable at temperatures lower than 90 degrees below zero, Fahrenheit, and is sufficiently rigid for use in temperatures up to 230 deg. F.

Polyethylene is colorless and translucent as originally manufactured but it can be formulated to produce colored products of exceptionally high lustre. These products can be fabricated by standard processes on existing plastics equipment.

Molded and extruded products, cloth coatings, flexible sheeting and film, and monofilaments are among the polyethylene plastic products which will be available in the future.

Polyethylene plastics are now restricted to applications covered by WPB Limitation Order No. 348. Technical data and samples for controlled end uses can be obtained by manufacturers with plastic-processing equipment by writing Plastics Division, Carbide and Carbon Chemicals Corporation.

(This advertisement has been reviewed and approved by the U. S. Navy Department)

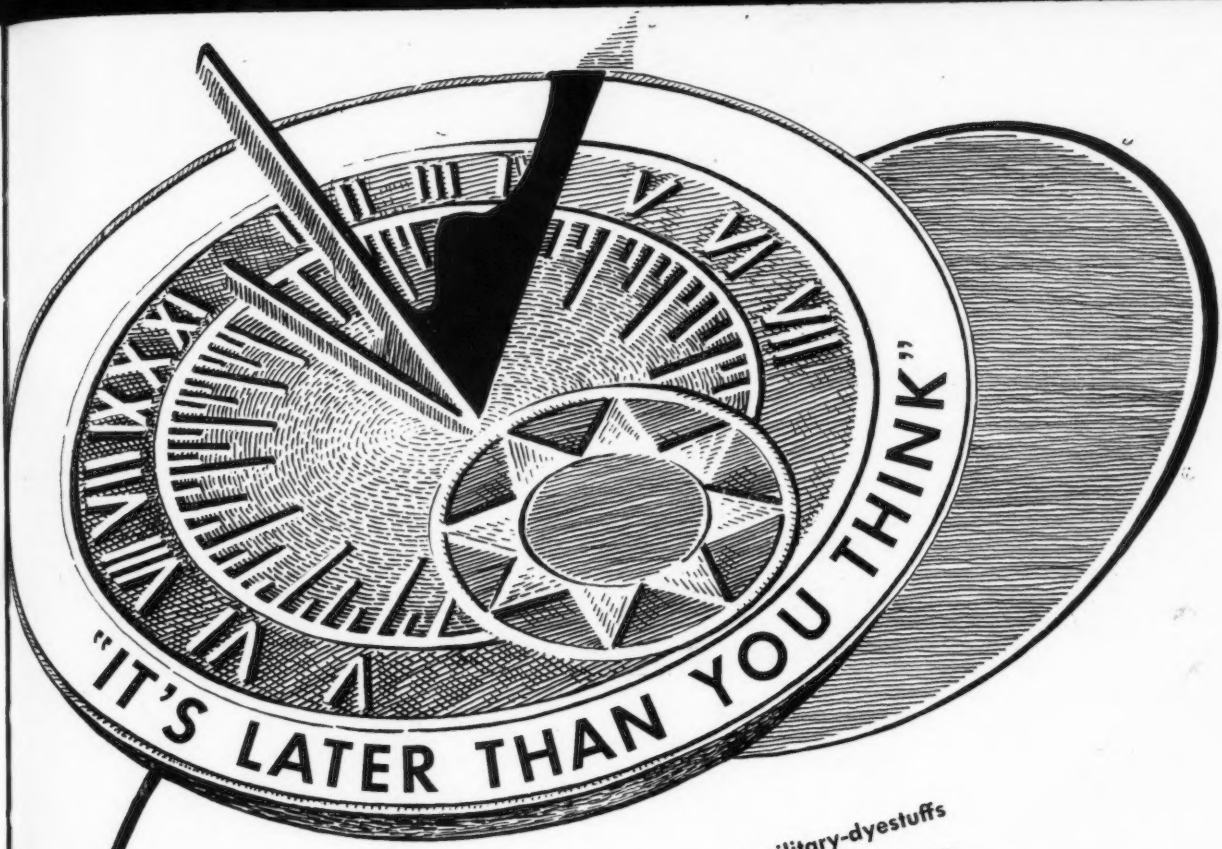
Plastics Division

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 EAST 42nd STREET, NEW YORK 17, N.Y.



Filling America's tremendous reservoir of military-dyestuffs and chemicals took time. To drain and refill it to overflowing for reconversion's demands will take a still longer time.

Right now, NATIONAL TECHNICAL SERVICE is staffed to meet your present needs for technical help *and* to render valuable aid on dyeing the new post-war textiles you may be working upon. Every hour of dye-formula development done *now* will hasten the delivery of your first post-war orders . . . will speed up your own complete reconversion to civilian fabrics.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET NEW YORK 6, N. Y.

BOSTON
PROVIDENCE
CHICAGO
PHILADELPHIA
SAN FRANCISCO
CHARLOTTE
GREENSBORO
ATLANTA
NEW ORLEANS
CHATTANOOGA
PORTLAND, ORE.
TORONTO

VELVAMINE K-90*

The new all purpose softening and finishing agent.

VELVAMINE K-90*

An improved softening and finishing agent suitable for all types of fabrics as it imparts an odorless finish, resistant to washing and dry cleaning.

Can be used as a substitute for sulphonated oils, tallows and other softeners, and its use eliminates yellowing and rancidity often encountered with the usual fatty type of softening agents. Can be used in conjunction with starch, wax and resin finishes, where it acts as a plasticizer and improves the hand of the finished goods.

When used with dullers, it gives a softer hand and greatly reduces the dusting of the finished goods which is common to most pigment type dullers.

It is an excellent treating agent for rayon prior to spooling and knitting, as the treated rayon becomes very smooth, supple and elastic.

Reg. U. S. Pat. Off.

Ask about PERMA-SET, the new permanently plasticized resin emulsion.

REFINED PRODUCTS COMPANY

REFINED PRODUCTS COMPANY

Lyndhurst • New Jersey

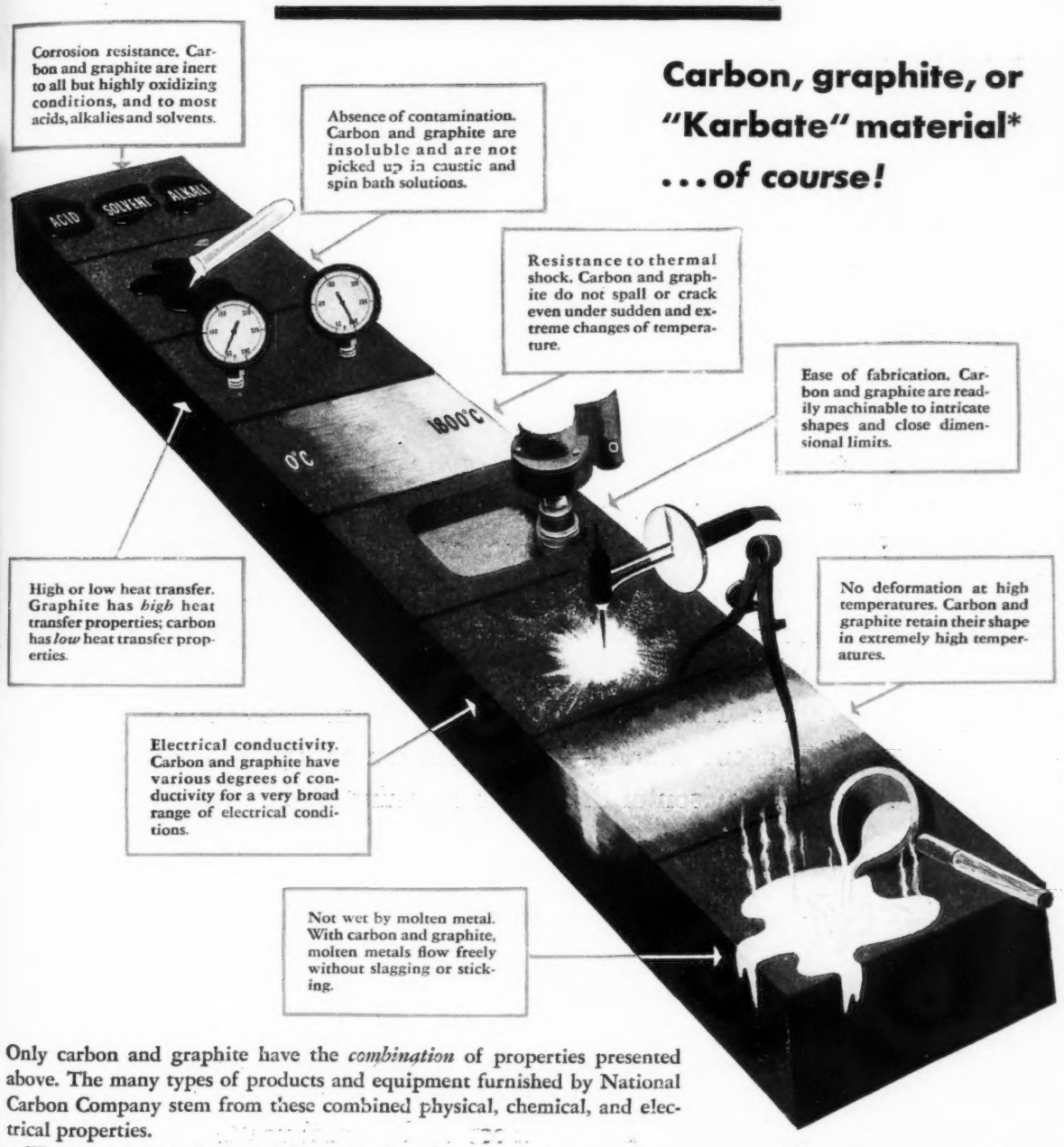
New England Representative: E. L. LEGG, P. O. Box 597, Providence, R. I.

Canadian Selling Agents: BERKELEY PRODUCTS CANADA, LTD., 41 Hillcrest Avenue, St. Catharines, Ontario, Canada

PERMA-CIDE • PERMA-TERGE • PERMA FIX • PERMA WET • PERMA PAR R • PERMA PAR K • PERMA PAR SOL • VAPOLINE

BAR OF *What?*

Carbon, graphite, or "Karbate" material* ...of course!



Corrosion resistance. Carbon and graphite are inert to all but highly oxidizing conditions, and to most acids, alkalies and solvents.

Absence of contamination. Carbon and graphite are insoluble and are not picked up in caustic and spin bath solutions.

Resistance to thermal shock. Carbon and graphite do not spall or crack even under sudden and extreme changes of temperature.

Ease of fabrication. Carbon and graphite are readily machinable to intricate shapes and close dimensional limits.

High or low heat transfer. Graphite has *high* heat transfer properties; carbon has *low* heat transfer properties.

No deformation at high temperatures. Carbon and graphite retain their shape in extremely high temperatures.

Electrical conductivity. Carbon and graphite have various degrees of conductivity for a very broad range of electrical conditions.

Not wet by molten metal. With carbon and graphite, molten metals flow freely without slagging or sticking.

Only carbon and graphite have the *combination* of properties presented above. The many types of products and equipment furnished by National Carbon Company stem from these combined physical, chemical, and electrical properties.

We urge you to study them. They not only make possible the present applications but are constantly suggesting new ones.

Many of these applications can further improve your manufacturing operations by decreasing interruptions, speeding up output, and cutting production and maintenance costs.

★ *BUY UNITED STATES WAR BONDS* ★

The word "Karbate" is a registered trade-mark of National Carbon Company, Inc.

*Carbon or graphite made impervious to seepage.

NATIONAL CARBON COMPANY, INC.
Unit of Union Carbide and Carbon Corporation
UCC
General Offices: 30 East 42nd Street, New York 17, N. Y.
Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

Liquid
HYDRALDEHYDE

THE NAME TO REMEMBER WHEN BUYING STRIPPING AGENTS

●

Outselling all others since its origin twenty years ago—it is *today* the woolen industry's *safe* stripper.
Our constant efforts to eliminate free zinc in *liquid* HYDRALDEHYDE through modern manufacturing methods assure stronger fibres in reworked wool and piece goods.

Test *liquid* HYDRALDEHYDE against any other stripping agent offered — either powder or liquid — for a true comparison of the fibre's breaking strength.

●

WATSON-PARK COMPANY

261 Franklin Street, Boston, Massachusetts

Factory — Lowell Junction, Mass.

Branches:

Cleveland, Ohio — Providence, R. I.

Canadian Selling Agents:

Harmont Color & Chemical Company, 35 Church Street, Toronto

Color Successes for Fall

With Keynotes by DAVIDOW

Color variety is the theme in the fall fashion picture. In fact, it's a season of color successes. And the firm of Davidow, long noted for the well bred character of its sportswear, has made distinctive use of cloudy pastel tints, rich medium tones and vibrant high shades. These are among the various fall color successes, which include numerous greens, with lime and sage highlighted by a gold cast...much wanted greys... tile and a rich rust brown to follow the bright reds of former seasons...checks, too, in contrasting color effects, and novelty weaves in blends.

"We consider color one of the most important factors in Davidow clothes," says Mr. Archibald Davidow. The firm's fall colors, as always, are chosen with the well dressed woman in mind and reflect the Davidow reputation for quality.

Always alert to color trends, Calco anticipates your needs for each approaching season, and welcomes the opportunity to advise you on the correct selection of colors and their application.

•

CALCO CHEMICAL DIVISION, AMERICAN CYANAMID COMPANY, Bound Brook, N. J., Chicago, New York, Philadelphia, Boston, Charlotte, Providence.

The colors shown may be reproducd with the new Calcomet wool dyes (see other side of page).

Rust-colored suit in smooth-surfaced wool, designed by Davidow.

COLORS BY CALCO

THE VALUE of the new line of Calcomet wool dyes in increasing production by reducing actual dyeing time to a minimum has been proved in plant runs. There is also a saving in labor, power and materials (including bichromate). The change in tensile strength during dyeing is less, and fastness properties are equal to those obtained by the top chrome method.

Calcomets are applied by an improved metachrome process developed through years of study and experimentation. The process is flexible and lends itself to the many types of machines now employed for dyeing wool. Rich, heavy-bodied shades, even jet blacks, can now be successfully produced for the first time with a metachrome process.

Technical service men trained in the application of Calcomets will be glad to assist you during initial dyeings. A complete line of Calcomet dyes is available for demonstration. Ask your Calco representative to arrange an appointment. CALCO CHEMICAL DIVISION, AMERICAN CYANAMID COMPANY, Bound Brook, N. J., Chicago, New York. Philadelphia, Boston, Charlotte, Providence.

PATENTS COVERING THE METHOD AND THE CALCOMET DYES HAVE BEEN APPLIED FOR

CALCOmets

Another CHEMystery Solved Through Research

Powerful IS THE WORD FOR SULFRAMINE DT*

Ultra's amazing new POWDER detergent

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AUGUST 28, 1944

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AMERICAN
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VOLUME 33 AUGUST 28, 1944 NUMBER 18

CONTINUOUS PEROXIDE BLEACHING

BY THE TECHNICAL STAFF
of the
Buffalo Electro-Chemical Co., Inc.

II.—Operation

This is the second in a series of four articles on the subject of continuous peroxide bleaching. The others in the series will follow in succeeding issues. The titles of the four parts are as follows:

I. Development
II. Operation
III. Equipment
IV. Adaptability

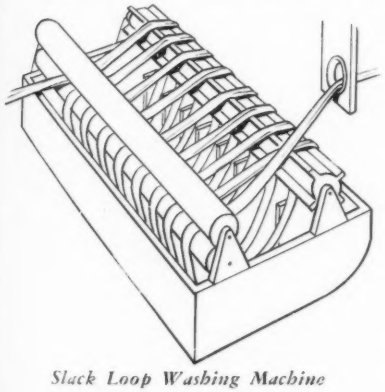
CONTINUOUS peroxide bleaching of cotton piece goods is now a well established process, handling millions of yards each week. In view of the extensive use at present and probable widespread adoption in the future, it is believed that a description of the operation of this system may be a matter of some interest. Although based on rope form processing, the following discussion is equally applicable to open width treatment, except for mechanical details of some of the machines.

There are many possible ways to route the flow of goods through a continuous peroxide bleaching process. The choice depends upon such factors as the character of the goods, the degree of bleaching required, and the cost of processing. In each case, some sort of scouring process usually precedes the actual bleaching step. Various pretreatments have been used such as plain water washing, acid treatment, caustic steaming and acid treatment followed by caustic steaming. These treatments are carried out as outlined below.

PRETREATMENTS

Water Washing

This is usually done in a slack loop washing machine. Either cold or warm water may be used. The warm water, of course, gives somewhat better scouring. It is the exceptional case in which an economical bleach can be obtained after a simple washing treatment. Unless the gray goods are exceptionally clean and free from motes, a more thorough preparatory treatment is advisable.



Slack Loop Washing Machine

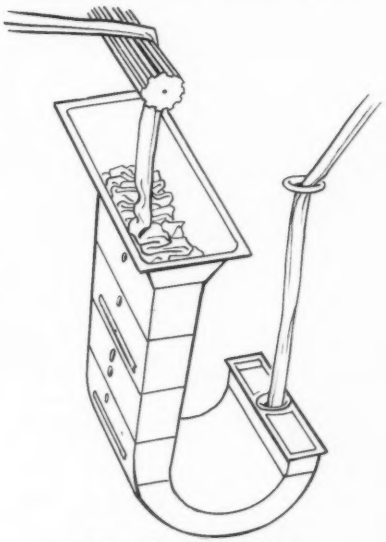
Acid Treatment

The goods are run through a padder or saturator containing acid of the strength desired. Sulfuric acid or hydrochloric acid is usually used, at a concentration of about 0.2%. The goods from the saturator are piled into a small J-box or a scray, which serves to hold them for a few minutes. The acid treatment may be carried out at room temperature or at somewhat elevated temperature. A wash completes this step.

Acid Treatment

Caustic Steam

This operation is carried out in a manner similar to that described above. The saturator contains a caustic soda solution of the desired concentration. About 3 or 4% is satisfactory in most cases. Additions may be made to this bath to increase the scouring action. Phosphates, silicates and wetting agents are sometimes used.



Piling Into Steam J-Box

In this treatment the goods are steamed in the J-box. It is desirable that the J hold the continuously moving goods for about one hour, at the highest possible temperature, in order to obtain the maximum scouring effect. The goods reach 217° F. or somewhat higher in the most recent apparatus.

Goods containing colored yarn and those made up of mixed fibers cannot be subjected to such vigorous scouring treat-

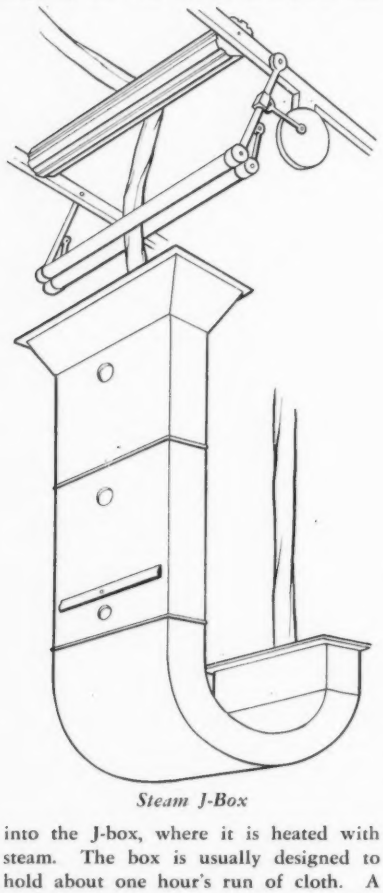
ment. For these classes of goods, an alkaline peroxide pretreatment has been worked out. The nature and amount of alkali are adjusted to the particular case. The amount of peroxide used is, in general, quite small. Its purpose is to protect the dye and to promote the cleaning action, rather than to attain a strong bleaching effect.

Acid Steeping Followed by Caustic Steaming

This is a combination of the two treatments mentioned above. Its purpose is a very thorough preparation to give the minimum chemical cost in the bleaching step. The savings in chemicals must be weighed against the additional capital expense and the complication of operating the additional machines.

BLEACHING TREATMENT

The actual bleaching, which is the final step, is carried out in a manner similar to that described above. The goods are saturated with a solution containing hydrogen peroxide and sodium silicate. Other ingredients are sometimes used in the bleach bath, such as caustic soda, detergents, etc. The saturated cloth is run

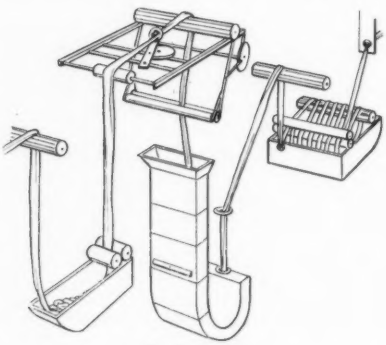


Steam J-Box

into the J-box, where it is heated with steam. The box is usually designed to hold about one hour's run of cloth. A washing machine pulls the bleached cloth from the lower end of the J, and completes the process by removing the spent bleaching chemicals. The cloth is then ready for the finishing range.

DETAILED OPERATING DATA

All of the various treatments noted above (except the simple washing) are carried out in the same type of apparatus, consisting of a saturator, a J-box and a washer. This combination of apparatus

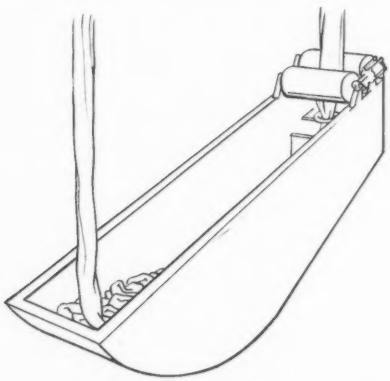


Basic Unit

is the basic "unit" of continuous peroxide bleaching equipment. The operation of such a "unit" for the bleaching step is described below in some detail. The operation of any other can be inferred from this.

Saturation

It is assumed that a supply of properly pretreated goods is available to the bleaching "unit." The first piece of apparatus is the saturator, which serves to apply the bleaching solution. This solution contains



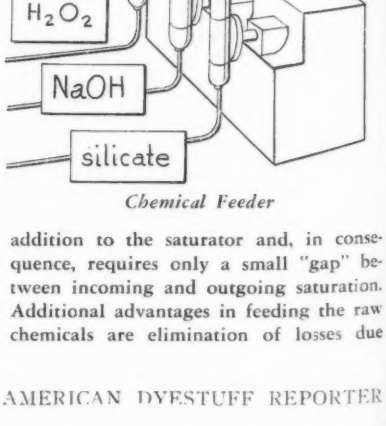
Rope Saturator

the same ingredients as those commonly used for peroxide kier bleaching, namely, hydrogen peroxide, sodium silicate and caustic soda. These chemicals are applied to the cloth in more concentrated solutions to offset the fact that 1:1 liquor ratios are to be used instead of 4 or 5:1 in the kier. Of course, the balance between the three ingredients and the total weight of chemicals used must be adjusted, according to experience, to obtain the required degree of bleaching.

A continuous supply of bleaching chemicals must be added to the saturator; this operation is somewhat complicated by the fact that the cloth is, in nearly every case, brought to the saturator wet. In order to analyze this problem, it is convenient to consider the saturator as a mixing device, whose function it is to blend the bleaching chemicals with the water already present on the goods. It may be considered that two streams of liquid enter the saturator—one a stream of water on the goods; the other a stream of bleaching chemicals from the storage supply. In order that the saturator neither overflow nor run dry, it is necessary that the outgoing goods carry just the sum of these two quantities of liquid. It follows that the goods coming to the saturator must be squeezed more heavily than those leaving. The "gap" between represents the space available for the chemicals.

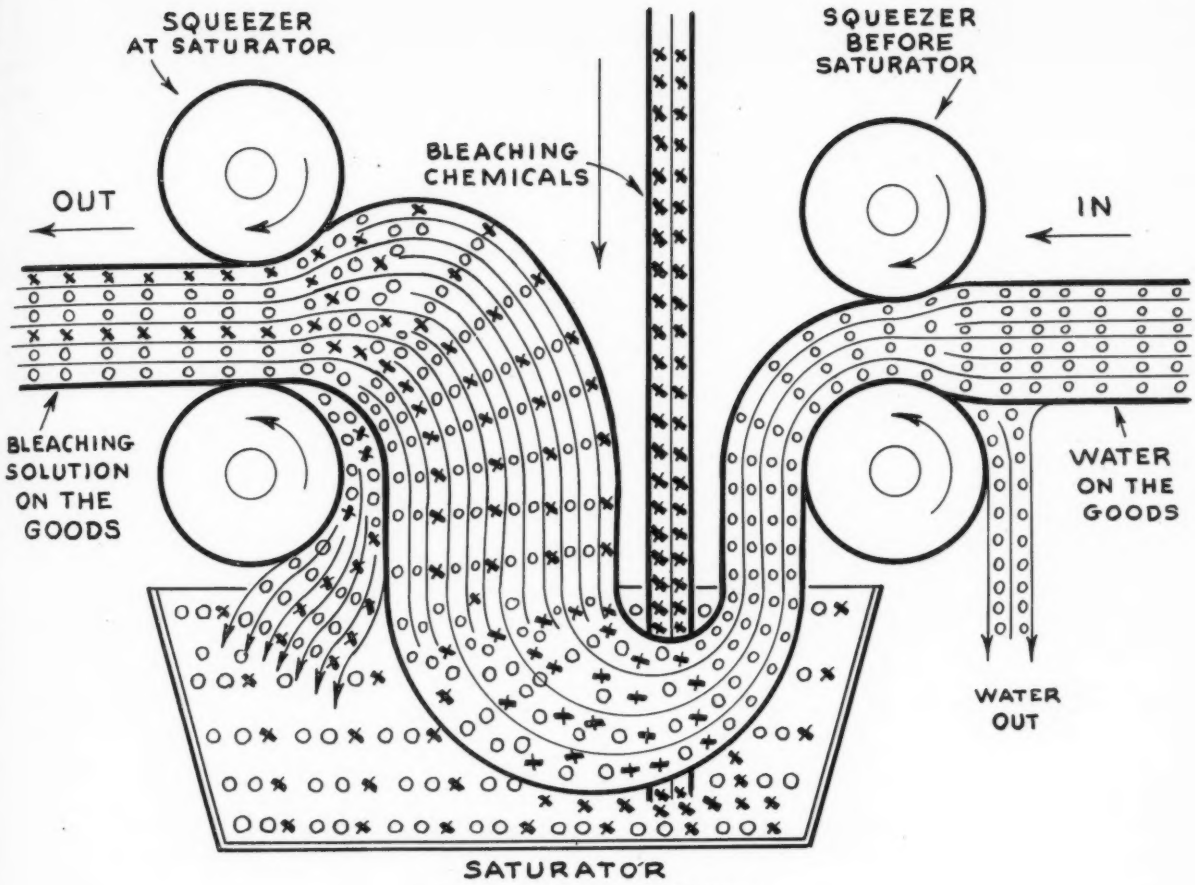
Certain difficulties arise from this situation. It is desirable to use dilute stock solutions because very concentrated solutions are quite unstable with regard to active oxygen content. On the other hand, a dilute stock solution demands a large "gap" between the moisture content of the incoming and outgoing goods and this in turn demands very heavy squeezing of the incoming goods. If it becomes necessary to get to the range of 50%-70% saturation, squeeze roll pressures up to one or two tons are required, and this causes difficulties with bearings and roll coverings.

A solution to this dilemma has been found in the use of proportioning pumps. In this case, the liquid 50% caustic soda, 40° Bé silicate and 100 volume hydrogen peroxide are fed, through separate compartments of the pump, right into the saturator. This implies the minimum of



Chemical Feeder

addition to the saturator and, in consequence, requires only a small "gap" between incoming and outgoing saturation. Additional advantages in feeding the raw chemicals are elimination of losses due



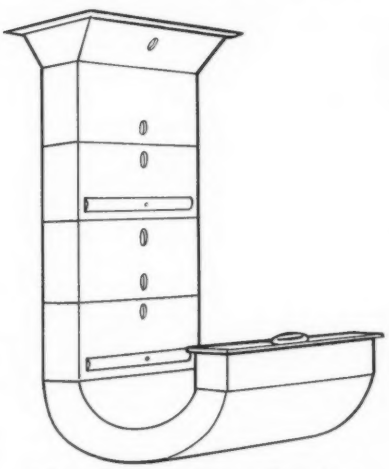
Functional Diagram of Saturator

to decomposition of stock solution, instant control over the formula and elimination of labor in making up stock solutions.

Hot Treatment

The second piece of equipment in the bleaching "unit" is the J-box, which serves the purpose of bringing the goods to the bleaching temperature, keeping them at this temperature for the required time, and then discharging to the next step. The J-box is an old device for storing goods, but its adaption to hot treatment is new. Direct steam is used as the heating medium. In the latest development, the steam is passed directly through the bulk of cloth, countercurrent to the cloth flow. This countercurrent system insures 100% utilization of the steam. Uniform temperature throughout the cloth is also assured, because the cloth has sufficient time to come to equilibrium with the heating medium.

Steam is applied directly to the goods in continuous peroxide bleaching. Consequently, some attention should be paid to its quality. The most important requirement is that it be free from slugs of water, which may cause wash-out marks or rust stains on the goods. Water separators of efficient design should be located as near as possible to the point where the steam contacts the cloth.



J-Box with Provision to Operate at Various Levels

Since the steam is utilized at very nearly atmospheric pressure, it will acquire some superheat in the process of being valved down from the steam mains. A reasonable amount of superheat is harmless, but it is not particularly desirable to use steam valved down from a very high pressure line. The amount of steam necessary, in pounds per hour, depends upon the temperature of the steam. For ease of control, it is best to have a steam supply that is reasonably constant in character.

Steam exists at atmospheric pressure only when its temperature is 212° F. or higher. Consequently, cloth that is brought to equilibrium with a saturated steam atmosphere is bound to reach a temperature of 212° F. or slightly above. In most cases, this is a very satisfactory temperature for bottoming and bleaching operations. There are cases, however, where a lower temperature is desirable. In these cases, it is possible to use mixtures of air and steam. Such mixtures can give any temperature between that of the steam source and that of the air source. The heat content of the mixtures becomes impractically low if temperatures below about 170° F. are attempted. Lower temperatures can be obtained when desirable by warming the saturator solution.

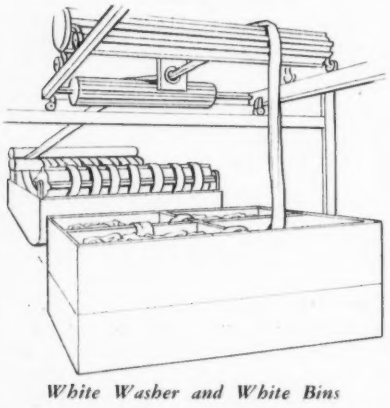
It is obvious that uniform bleaching demands a uniform temperature on the goods. This can be assured only by bringing the goods to equilibrium with an at-

mosphere which is maintained at the desired temperature. In the case of "pure" steam this is relatively easy to accomplish, because each unit volume contains a large number of Btu. In the case of air-steam mixtures, the best way to guarantee equilibrium is to pass the warm gas mixture through the packed goods in the J-box countercurrent to the flow of cold goods.

It is to be noted that continuous bleaching employs less steam than kier bleaching. The saving results from the fact that, per pound of cloth, only about a pound of bleaching solution has to be heated, in contrast to four or five pounds in the kier. In the latest steam bleaching apparatus, the cold saturated goods move countercurrent to the steam flow so that virtually perfect heating efficiency is obtained.

Washing

After leaving the J-box, the cloth is washed. Either tight strand or slack washers may be employed. The tight strand machine is easier to operate at high speed, while the slack loop machine



White Washer and White Bins

is much more efficient, in point of washing effect obtained per unit of water used. Very thorough washing is to be recommended for minimum bleaching cost. Speed is the only special point to be considered in connection with washing equipment for continuous bleaching. It should be remembered that a saturator and J-box can be run at almost any cloth speed. The limiting speed is set only by the washers.

The operation of a complete continuous bleaching range may now be visualized. Consider a hypothetical bleachery designed to turn out a large volume of white sheeting at the lowest chemical cost. In such a case it might be decided to employ a strong caustic steaming followed by a peroxide bleaching step. The use of warm water is decided upon, so that slack loop washers will be used. The diagram below illustrates such a scheme.

It will be noted that this particular system employs two of the basic "units," one for the caustic prepare and one for the bleaching step proper. Other schemes employ one, two or three of these units to make up a complete range.

GENERAL CONSIDERATIONS

Continuity of Operation

There are obvious advantages in the "continuous" features of continuous bleaching. It is possible to connect the whole wet processing in one line, from gray room through singers, bleaching range, finishing range and dry cans. This, of course, involves the operation of a very long line. It is often advantageous to break off at white bins. Local conditions will govern this choice.

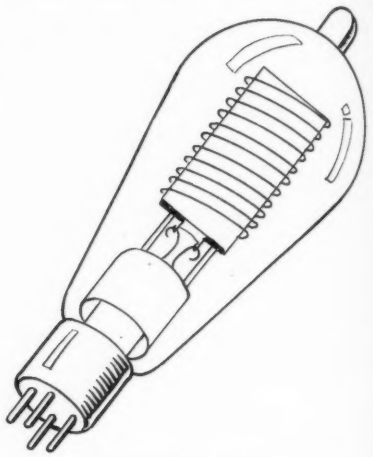
It is necessary to have an adequate supply of gray goods on hand, in order to avoid stoppages. The continuous bleaching method shows up to best advantage on long runs of similar or identical goods. It is good practice to sort as much as practicable, in order to minimize changes in running speed and in saturator formulas.

A breakdown in any machine shuts down the whole bleaching range. It is of obvious importance to have each piece of equipment in good running order.

Electric Motor Drive

By the very nature of a continuous operation which comprises several steps, it is necessary to keep all of the parts in synchronization. Adequate speed control is difficult with A. C. motors, which ordinarily change speed with every load change. A complete bleaching range, containing perhaps ten to fifteen unsynchronized motors, is somewhat difficult to operate. D. C. motors possess inherent constant speed characteristics and are much better suited for group operation. A source of D.C. power is necessary to obtain this advantage.

The most modern and most versatile system of motor synchronization and control utilizes electron tubes to furnish D.C.



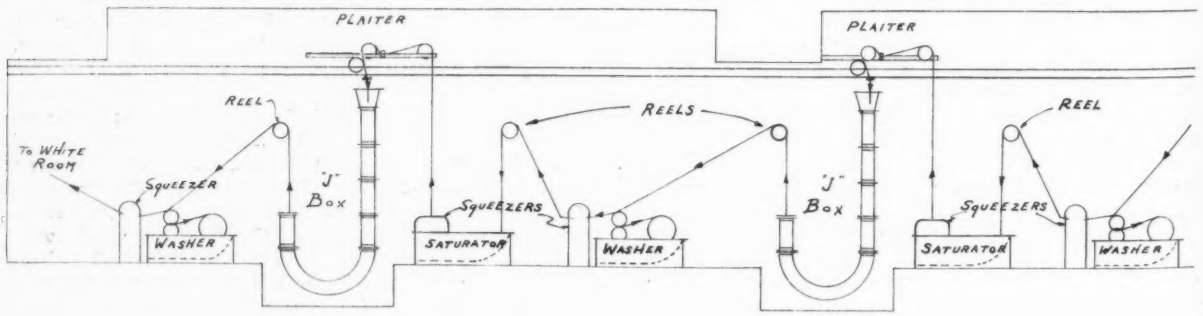
Electronic Device

power for each individual motor right from the A.C. lines. Such a scheme, as typified by the Thymotrol system, seems to possess control characteristics ideally suited to the needs of a continuous bleaching range. Experimental installations of this kind are to be made as soon as conditions permit.

Centralized Control

As the system is perfected, the control of the range can be centralized at a few points. The ultimate objective is one-man operation of a whole bleaching range from one central control point. Future developments, many of them already in the

(Concluded on Page 380)



SIDE VIEW

Complete Peroxide Bleaching Range

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AUGUST 28, 1944

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Symposium on

"THE TEXTILE CHEMIST IN THE POST-WAR WORLD"

To be Held at Annual Meeting, Atlantic City, N. J., October 13th

THERE will be many novel features introduced at the Annual Meeting to be held this year at Atlantic City, New Jersey, on October 12th, 13th and 14th, with the Philadelphia Section acting as hosts. One of the many features is a symposium on "The Textile Chemist in the Post-War World." C. A. Seibert, general chairman of the convention, has furnished the following particulars concerning it:

Wm. D. Appel, president, will preside at this symposium which will take place during the afternoon of Friday, October 13th. Between the inroads of the draft on the younger textile chemists and the rapid rise of recent research developments, there is an acute shortage of technical men in our industry. This dirth will get more acute as the war goes on and even for some years after it is ended. Some of the phases of this problem will be discussed by three outstanding men, well qualified to handle them: Dr. Samuel C. Lind, Dr. Hugh S. Taylor and Andrew Fraser, Jr.

Dr. Lind, the first speaker, is dean of the Institute of Technology, University of Minnesota, and a past president of the American Chemical Society. He will speak on "The Undergraduate Course in Textile Chemistry." As a student he matriculated from five colleges: Washington and Lee, Massachusetts Institute of Technology, Leipzig, University of Paris, and the Radium Institute of Vienna. As a teacher he taught at 3 colleges: Massachusetts Institute of Technology, University of Michigan, and University of Minnesota, not to mention his activities at the Bureau of Mines and the Fixed Nitrogen Laboratory. He has therefore had wide experience both in giving and getting a chemical education.

He is a member of 16 scientific societies, in many of them an officer. His own research work covers radio activity, radiations, the kinetics of chemical reactions, photo chemistry, the chemical effects of electrical discharges, etc. For outstanding work he was given the Nichols medal award. The A.A.T.C.C. is indeed fortunate in having a man of his ability and experience talk to us on undergraduate education of chemist.

"Postgraduate Training and Research for Textile Chemists" will be discussed by Dr. Taylor, also a recipient of the Nichols medal. Born and educated in England at the University of Liverpool, he also has degrees from the Nobel Institute at Stockholm, from Hanover, and honorary degrees from Louvain, Providence College & Rutgers. Most of his teaching life has been spent at Princeton where he is now Chairman of the Chemical Dept. Fourteen societies here and abroad claim him as a member, a councillor or a vice president. His recent association with the Textile Research Institute and their establishment of their laboratories at Princeton brings him closer than ever to our textile problems, so that his advice and suggestions on chemical education should be stimulating.

The third and last speaker has studied that most essential part of a chemists' life, —his salary. His contribution is his recent survey of the professional and economic status of the 30,000 members of the American Chemical Society, made under the joint sponsorship of the society and the U. S. Department of Labor. For us he will re-analyze that wealth of data to give an adequate picture of the financial and professional progress of chemically trained men in various fields with particular reference to textiles. Certainly no one in this country is better qualified to do this than Mr. Fraser.

No doubt this symposium will be one of the highlights of the coming annual convention. As textiles led the way in turning from peace to war, so may they be expected to be among the first to return to civilian output. One of the greatest factors in the reconversion of any industry back to peace is that of technical manpower and that is the reason for presenting this symposium at this time.

TRANSPORTATION, ANNUAL MEETING

THE Transportation Committee for the Annual Meeting in Atlantic City on October 12th, 13th and 14th, presents the following probable times of departure for the shore:

From Broad Street Station, Philadelphia or, 30th Street Station, 4 minutes later or, North Philadelphia Station, 12 minutes later

8:15 10:30 1:30 4:25 5:25 8:35 11:59
(Arriving in Atlantic City about an hour and a half later.)

From Market Street Wharf, Philadelphia direct

6:50 4:00 5:00 6:00
and by changing cars in Haddonfield, N. J.
9:20 11:40 5:20 8:40

From New York, Pennsylvania Station, direct to Atlantic City

10:15 3:15
(Arriving in Atlantic City about three hours later)

The transportation committee will have schedules of train departures from Atlantic City listed in the Claridge Hotel during the meetings. The committee suggests that Pullman reservations be engaged on or about September 15th at your home station.

RESERVATIONS, ANNUAL MEETING

THE Reservation Committee for the Annual Meeting to be held in Atlantic City, N. J., on October 12th, 13th, and 14th, wishes to make the following announcement:

"We anticipate having available for the meeting, accommodations for approximately 1,500 people, and at least 90 per cent of the hotel rooms are arranged to be occupied by two people. All of the hotels prefer double occupancy. The cost per person with double occupancy will run from $4.00 to $8.00, and for single occupancy the same room will cost from $7.00 to $11.00, if available.

"Under present circumstances we advise that it would be most satisfactory if all reservations were made through:

"Harold B. Dohner, Chairman, Registration and Reservations Committee, Amalgamated Chemical Corp., Ontario & Rorer Streets, Philadelphia 34, Pa."

EXHIBIT OF ALIEN PATENTS

THE coming Annual Meeting at Atlantic City in October has already broken the record in number of "firsts." It will be our first Annual Meeting after a lapse of three years;—the first award of the Olney Medal will be made there;—the first trial of a National Personnel Service; and finally, the first exhibition of Alien patents selected for their application to textiles.

This patent exhibit is largely due to the efforts of Mr. Chester North of the Washington Office of the Alien Property Custodian. He has arranged to have the patents on display properly indexed and will supply an attendant familiar with the exhibit. As many of these patents are the basis of profitable foreign monopolies, cartels, etc., and all are now available to bona fide American manufacturers either large or small at a very nominal fee, this is a golden opportunity to adopt these brain children of the best German scientists, chemists and engineers. Such adoption will further our own war efforts by using some of the enemy's own weapons against him. An index of all enemy patents both textile and otherwise, has already been published and is available. The selected textile patents may be seen at Atlantic City so that those of particular interest to any American Companies or individuals may be obtained and used under a non-exclusive license from the Alien Property Custodian.

MEETING, EXECUTIVE COMMITTEE ON RESEARCH

THE next meeting of the Executive Committee on Research will be held in Atlanta on September 8th. In addition to regular business to come before the meeting, the committee plans to go into very thoroughly, and to attempt to coordinate work, on the following projects: Detergency Committee, Installation of Equipment at Lowell, Washfastness Committee Report, Progress Reports on Other Work Being Done.

APPOINTED TECHNICAL PROGRAM CHAIRMAN, NEW YORK SECTION

EMMETT J. DRISCOLL, Chairman of the New York Section, has announced the appointment of Commander Walter F. Prien, SC, U. S. Navy, as chairman of the technical program committee for the 1944-45 season.

Commander Prien is the executive officer and director of research and development at the U. S. Naval Clothing Depot, Brooklyn, N. Y. He has been an active member of the New York Section for the past several years, serving as vice-chairman of the technical program committee last season.

It is now planned to have four technical meetings during the season, the first of which is scheduled for November 17th. Others are tentatively scheduled for January 12th, March 16th and May 18th. The names of the other members of the committee will be announced later.

Report of the Nominating Committee

THE Councilors representing Sections, in their capacity as Nominating Committee, have directed the Secretary to report the following nominations for the election of 1944: for President, William D. Appel; for Vice President: Hugh Christison; for Vice President, Henry F. Herrmann.

Under the Constitution, additional nominations, each signed by at least twenty-five Senior members, filed with the Secretary not later than October eighth, will be given equal standing on the ballot.

Respectfully submitted,
HAROLD C. CHAPIN,
Secretary.

Saturday Afternoon Session, Annual Meeting

(Reprinted from last issue)

IN ORDER to report even a fraction of the vast amount of research and investigational work done in the last three years, many of the technical papers to be presented on Saturday morning have been prepared as resumes. Realizing that there has been much important work done which has not been included in the program, the Technical Program Committee has arranged for a Saturday afternoon session, at which individual or corporate members may present 25 to 30 minute papers or movies to report such work. This session is being arranged in response to several requests by manufacturers for an opportunity to report their work. There will be time for five or six such presentations on Saturday afternoon beginning at 2:00 o'clock.

Members who desire to present papers at that time should communicate with the Technical Program Committee immediately. It will be necessary to submit a 65-75 word abstract together with the title of the paper and the name of the author not later than September 10. This will allow adequate time for printing. In case more papers are submitted than the time permits, the Technical Program Committee reserves the right to select those to be presented. If too few papers are submitted, this Saturday afternoon session will be cancelled.

GLEN S. HIERS
Chairman, Technical Program Committee
Collins & Aikman Corp.
5000 Parkside Ave.
Philadelphia 31, Pa.

A. A. T. C. C.

PERSONNEL SERVICE
Atlantic City Meeting
October 12-14, 1944

Candidates for Employment:

Write to Dr. H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass., for application forms or secure them at the meeting.

Employers:

Advise Dr. Chapin of your interest and personnel requirements now, if possible. If not, consult the Service at the meeting.

For further information, see July 31, 1944, issue of
AMERICAN DYESTUFF REPORTER

This service is free to all A.A.T.C.C. members!

CALENDAR OF COMING EVENTS

Meeting, South Central Section, Patten Hotel, Chattanooga, Tenn., September 9, 1944. Dinner, 7:00 P.M. Speaker: Mr. Hopkins, Stonecutter Mills Co., Spindale, N. C., "Dyeing and Finishing of Acetate Rayon Piece Goods."

Meeting, Southeastern Section, Callaway Institute, La Grange, Ga., September 9, 1944.

Annual Meeting, Hotel Claridge, Atlantic City, N. J., October 12, 13 and 14, 1944. Auspices of Philadelphia Section.

Meeting, Rhode Island Section, September 29, 1944.

Meeting, Philadelphia Section, September 29th, 1944

Note: Secretaries of local sections are requested to advise the AMERICAN DYESTUFF REPORTER of meeting dates for the 1944-45 season as soon as available.

THE PRESERVATION OF CORDAGE*

Results of Research Work on Untreated and Treated Cordage to Assess the Value of Protective Treatments and Determine the Rot Resistance of Untreated Cordage Made From Different Types of Fibers.

AUDREY S. TWEEDIE and C. H. BAYLEY

National Research Laboratories. Ottawa

DURING the past four years large quantities of cordage for use by the armed services have been manufactured in Canada. The outbreak of the Pacific war almost completely cut off the supply of fibers (manila, sisal, etc.) normally used for the manufacture of "hard fiber" cordage. It thus became necessary to make use of substitutes to conserve such supplies of these fibers as were on hand or could be obtained, and to ensure that these were used only when absolutely necessary. For example, manila fiber had been used in cordage for guy ropes and lashings for Army tents, and it appeared that for this purpose recourse might be had to a more easily obtainable type of fiber. It was therefore decided to investigate the use of cotton cordage for this purpose, and it was found that the necessary physical characteristics could be obtained.

There were, however, two respects in which cotton cordage could be expected to be less satisfactory than manila cordage—viz., a tendency to show a greater degree of swelling when wetted, and, possibly, a greater degree of susceptibility to rotting under the action of micro-organisms which attack cellulose.

THE PROBLEM OF "ROTPROOFING"

The problem of the protection of textile materials against this latter type of attack, or "rotproofing" as it has come to be called, has assumed great importance in the last two years. This has been an obvious outcome of the fact that textile war materials are now being used in tropical climates where the conditions of temperature and humidity favor the year-round and intensive growth of cellulose-destroying organisms, and for this reason it is especially necessary to provide for the protection of materials (e.g., tentage, tarpaulins, camouflage nets, etc.) which, being used in the open, are constantly subjected to conditions which favor their destruction by these agencies.

It is well known that many of the micro-organisms present in the soil are of a type which attack cellulosic materials, and hence it is essential that textile materials which, during the course of their use, may come in contact with the soil, be given a suitable treatment to counteract the destructive effect of these organisms. The most obvious example of this need is in the case of fabrics used for sandbags where under suitable conditions of temperature and humidity rotting occurs within a few weeks owing to the fact that the fabric is in contact with the soil.

It should be emphasized here that damage of this type readily occurs in any part of the world where the necessary conditions of temperature and humidity obtain. It can occur in temperate climates almost as readily as in more tropical locations. This fact is frequently overlooked and the prevalence of the destruction of cotton textiles as a result of microbiological attack is only beginning to be realized. Thus, in Canada, damage of this type to materials exposed out-of-doors may readily occur in Eastern Canada during the spring, summer and fall months, and in the coastal regions of British Columbia throughout most of the year. Textile materials stored indoors under warm and humid conditions anywhere in Canada may suffer attack at any time of the year. Prevention of the micro-biological attack which occurs in certain types of sizes and finishes used in the processing of cotton and rayon yarns is a well-known problem in textile mills.

There is every indication that the treatments which have been developed during the war for the protection of textile materials from microbiological attack will find a wide application to many types of peace-time textiles—e.g., tarpaulins, awnings, textiles used in farm implements, cordage, etc. Incidentally, an extension of this problem to the preservation of cordage used in fish nets and fishing gear merits study.

PROTECTION AGAINST DETERIORATION

It is well known that the highest qualities of cordage are manufactured from fibers—e.g., manila—which, in addition to having high tensile strength, also possess a good fiber length. If the course of one of the fibers in such a rope is traced, it will be found that the fiber comes to the surface of the rope several times throughout its length. It will therefore be apparent that any deterioration, even if it be only on the surface of the rope, will produce a reduction in the effective length of the fibers in the rope and therefore in its tensile strength. For this reason a disproportionately large reduction in tensile strength of a rope may be caused by surface damage, whereas it is commonly believed that the loss in tensile strength is proportional to the area of the cross-section affected.

For this reason adequate protection of the surface of the rope against deterioration is of the utmost importance.

Whilst, in the case of cordage, preservative treatments involving the application of tars, creosotes, etc., have been used for many years, there is no doubt that these treatments, because of the temporary nature of their effectiveness, are far less desirable than certain effective treatments which are in current use.

EFFECTIVENESS OF VARIOUS TREATMENTS

Figure I illustrates the differences in effectiveness of various treatments applied to manila cordage when the latter is exposed to microbiological attack by organisms present in sea water. It will be noted that the commonly used pine tar treatment is not particularly efficacious.

In working out preservative treatments for cordage, it is also necessary to consider certain other factors in addition to rot resistance. Such properties as flexibility, resistance to abrasion and resistance to water, as well as the possibility of deleterious chemical action resulting from the rotproofing compound, must be considered.

The following requirements for twisted ⅜-inch diameter, water- and rot-resistant rope used for tarpaulin and tent stays and lashings, etc., taken from the current Canadian specification, will serve to illustrate the present trend in cordage preservation: (See Table 1 on next page.)

* Reprinted from "Canadian Textile Journal." June 30, 1944.

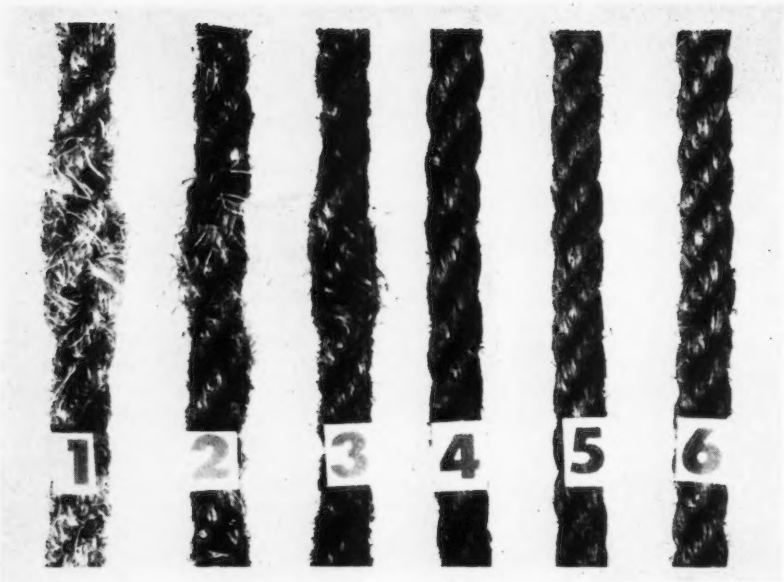


FIG. 1

1. *Untreated.*
2. *6 per cent Pine Tar.*
3. *4 per cent Lead Soap.*
4. *4 per cent Lead Soap and Copper Naphthenate (1.5 per cent copper).*
5. *6 per cent Pine Tar and Copper Naphthenate (1.5 per cent copper).*
6. *Copper Naphthenate (1.5 per cent copper).*

All samples immersed in sea water, Southern California, for six months.

TABLE 1
Physical Properties of Treated Rope

	Cotton	*Hemp*	*Manila*	*Sisal*	*Wartime*
Diameter (inches)*	3/8	3/8	3/8	3/8	3/8
Ply (minimum)	3	3	3	3	3
Strands per ply (minimum)..	..	6	4	4	4
Length of 10 turns (inches)					
maximum	11.5	14.5	13.5	13.5	14.5
minimum	8.5	11.5	10.5	10.5	11.5
Weight (feet/lb. 17.5 lb. tension) (minimum)	19	19	19	19	19
Breaking Strength (lb.) (minimum)**	950	950	950	950	950

* A tolerance of plus or minus 1/32nd-inch is permitted.
** Breaking strength determined with length of 10 inches between jaws of machine.

Details of the preservative treatment required in the specification are as follows:

"The finished rope shall be made highly water repellent and rot resistant by the application of a suitable water repellent compound containing copper naphthenate together with suitable pigments as may be necessary to give the required color. When subjected to the water repellent test described in paragraph 3.7, the increase in weight shown by the sample shall not exceed 25 per cent. The finished rope shall contain not less than 0.5 per cent copper as copper naphthenate and shall satisfactorily meet the requirements of the fungus test given in Method 28 of Schedule 4-GP-2, "Methods of Testing Textiles," of the Canadian Government Purchasing Standards Committee. In the case of cotton rope the color of the finished rope shall be brown or olive drab.

"The use of aluminum stearate, Gilsonite and lampblack or equivalent products is permitted. The use of starch, casein, glue, gums, resin, vegetable oils, oxidizing oils, or resins modified with such oils is prohibited. The compounds used for treating the rope shall be substantially free from sulfur and its compounds.

"The residue obtained by extraction of the finished rope with petroleum ether and benzene in a Soxhlet apparatus shall not exceed 22 per cent when determined by the method given in paragraph 3.8 of this specification.

"The finished rope shall be free from toxic or irritating materials.

"The finish shall penetrate to the center of the rope.

"The treated rope shall be approximately as flexible as the untreated rope from which it is made."

Many of the details of the preservative treatment are similar to the requirements of U. S. Quartermaster Department specifications for treated cotton rope (J.Q.D. 101B and J.Q.D. 253), and for treated jute rope (J.Q.D. 267). It is also of interest to note that the U. S. Government requires the application of a preservative treatment in the case of manila rope (Specification E-T-R-601A).

METHODS OF TESTING ROTPROOFNESS

The methods of test usually employed for measuring resistance to micro-organisms fall into two general classes—viz., the pure culture test and the soil burial test. The first type of test makes use of a pure culture of an active cellulose-destroying fungus such as *Chaetomium globosum* or *Metarrhizium* species, a sterilized specimen of the sample, supported on a suitable culture medium, being inoculated with a culture of the organism and incubated at 85° F. to 90° F. for two to four weeks. The degree of resistance of the sample is then determined by noting whether or not growth takes place on the sample. In some cases measurements of breaking strength before and after incubation are carried out.

In the second method the samples are buried in a standard composted garden soil maintained at the required degree of moisture and at 80° F. to 90° F. Times of burial vary from 2 to 6 weeks, depending on the type of material under study. Breaking strength measurements are carried out on the sample before and after burial.

Experience has indicated that the soil burial method is somewhat more severe in its action than the pure culture test. It is recommended for use in all cases where the material tested may come in contact with the soil during use or may suffer heavy contamination from air-borne soil organisms—e.g., sandbags, tarpaulins, camouflage nets, or other materials intended for outdoor use.

In both the above tests it is usually desirable to subject the sample under investigation to leaching by water prior to the test in order to determine the extent to which the rotproofing material is dissolved out by water. It is obvious that this has an important bearing on the permanence of the rotproofing treatment applied to materials for outdoor use. Full details of these methods of test are available (1).

EXPERIMENTAL RESULTS

The following data give the results of work carried out on various types of untreated and treated cordage for the purpose of assessing the value of the treat-

(Continued on Page 378)

The Determination of VEGETABLE MATTER CONTENT of Wool

H. J. WOLLNER, LOUIS TANNER, and IRVING MICHELSON
Bureau of Customs, U. S. Treasury Department

VEGETABLE matter presents one of the most difficult problems in the analysis of raw wool for clean wool content. It is present in all raw wools, and its quantitative removal, either mechanically or chemically, by any practical procedure is impossible without the loss of appreciable quantities of wool. A method is here presented for the rapid examination of scoured or degreased wool and the estimation of the quantity of vegetable matter therein. This method makes use of the optical properties of wool in such manner that the particles of vegetable matter may be examined without losing or damaging the wool. The method may also be applied to other materials, the particle impurities of which it is desired to examine, or which are to be examined for the presence or absence of a desirable particle component.

The vegetable matter normally present in wool is introduced by the sheep's contact with vegetation growing on the range. It may consist of only one type of vegetable matter, or of many types. It is usually found distributed non-uniformly throughout a fleece (sometimes occurring in large clumps) and unequally among fleeces. Some types will be firmly held in the tangle of fibers, while some will drop out easily if the fibers are separated sufficiently. Most of it is embedded in the mass of wool; very little is visible on the surface. A portion of the original vegetable matter in the raw wool is usually not removed by the various cleaning processes, and it is often necessary to determine the quantity present in the final product.

Several methods of determination of the vegetable matter content of wool are in use. These are the hand picking method, the sodium hydroxide method, the peroxide-carbonate method[1], and the carbonizing method[2].

The hand picking method is the most accurate and the most time consuming. The vegetable matter is removed piece by piece, the operator very carefully searching the wool. The removed pieces are thoroughly cleaned and weighed. The testing of a sample of 50 grams by this method may require several days.

The sodium hydroxide method is much more rapid, but not nearly as accurate. The wool is dissolved in boiling sodium hydroxide solution and the vegetable matter is filtered or centrifuged out, washed, dried, and weighed. However, a variable quantity of lignin and other components in the vegetable matter are also dissolved. No constant factor can be applied to test results, which may be too low by as much as 40 per cent of the actual vegetable matter content.

The peroxide-carbonate method is a modification of the sodium hydroxide method. The wool is first oxidized by hydrogen peroxide and then dissolved in sodium carbonate. This treatment does not affect the vegetable matter as much as the sodium hydroxide treatment. Nevertheless, the recovery is not complete, the percentage recovered is different for the several types of vegetable matter, and may vary by as much as 9 per cent for a single type.

Carbonizing is the most widely used commercial method of removing vegetable matter from scoured wool. It involves a large number of manipulations which are difficult to adapt to laboratory scale. The wool is steeped in a solution of sulfuric acid or aluminum chloride, centrifuged or squeezed, heated, crushed, dusted, neutralized, rinsed and dried. The loss in weight is assumed to be vegetable matter. Actually, a significant quantity of wool is also lost in this process, particularly in the case of very burry or unsound wools.

It may be noted in passing that some individuals in the wool trade have acquired a background of experience which enables them to estimate vegetable matter content by visual and kinesthetic examination. This subjective method has the disadvantages of the basic inaccuracy of carbonizing as a method of determining vegetable matter content, and of a lack of uniform bases of experience, i.e., the non-uniformity of wool losses in commercial carbonizing.

For the determination by this laboratory of the clean content of a large number of samples of wool, it was found necessary to develop a means of rapidly and accurately measuring the quantity of vegetable matter remaining in the wool after scouring. The above methods were found to be unsuitable both as to accuracy and speed. The method described below was developed to meet these requirements.

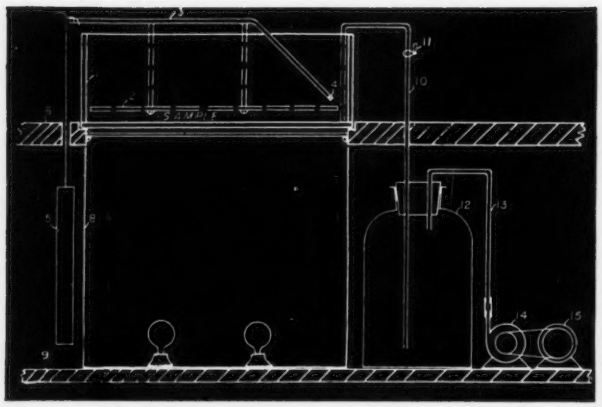
COMPARISON METHOD

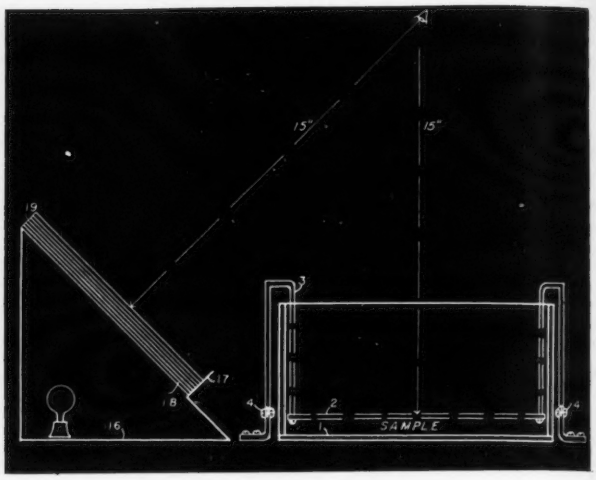
Principle

This method consists of the immersion of the sample in a liquid having the same optical properties as the sample so that a continuous, homogeneous optical medium is obtained, resulting in the invisibility or transparency of the wool fibers. Imbedded particles having different refractive indices or colors remain visible and can be examined. These particles, under proper conditions of illumination, can be counted or compared and matched with photographs of known weights of the same type of materials, and in this manner indirectly weighed.

The process of making an object invisible is an application of a familiar principle in physical optics, which is widely used in microscope technique[3,4]. The visibility of a colorless object is caused by the refraction or reflection of light at the surface of the object, and this occurs only when the medium surrounding the object has a different index of refraction. If an object is immersed in a liquid having the same optical properties (refractive index and color) as the object, a continuous, homogeneous medium for the transmission of light results, and the object is no longer visible since no refraction or reflection, or differentiating color absorption takes place.

The index of refraction of wool (1.555) may be duplicated by a suitable mixture of liquids such as monochlornapthalene and a petroleum distillate. In such a medium wool becomes transparent, but the impurities, having different indices of refraction and colors, will be almost





Above—Fig. I; Right—Fig. II

KEY TO FIGURES I AND II

1. Immersion vessel, 10" x 12" x 4".
2. Cover glass.
3. Frame for holding cover glass.
4. Pivot of frame.
5. Weight for pressure on cover glass.
6. Table top.
7. Opal glass.
8. Illumination box.
9. Table shelf.
10. Copper tube for liquid.
11. Stopcock.
12. Reservoir for liquid.
13. Tube for air.
14. Air pump.
15. Motor.
16. Standards illuminator.
17. Standards indexing shelf.
18. Opal glass.
19. Standards plates.

as visible as though no wool surrounds them, and may be compared with suitable standards.

Equipment

The apparatus required in this method consists of an immersion vessel with a translucent bottom illuminated from below, a set of photographic standards (transparencies) representing weighed quantities of the materials being sought, and a standards illuminator, or viewing device for the standard photographs.

For determining the percentage of vegetable matter in scoured wool samples, a 10 x 12 inch rectangular vessel, 4 inches deep, inside dimensions, with a transparent bakelite bottom has been found suitable. A hinged plate glass cover is used to compress the wool after immersion in the medium; this prevents wool from floating to the surface and also increases the visibility of the vegetable matter when the refractive index of the liquid medium is not exactly the same as that of the wool. The vessel is illuminated from below by diffused light (Figures I and II).

Photographic standards provide a facile means for comparing and matching the vegetable matter in immersed samples with weighed quantities of comparable material. These standards are a set of 10 x 12 inch transparencies in several series, each series representing a single type of vegetable matter in the exact original size. The weights within each series are in steps similar to the units of a set of weights, so that any quantity of vegetable matter can be represented by a suitable combination of a minimum number of superimposed photographs.

The standards illuminator is a device for viewing the photographic standards by transmitted light. It is a box with a 10 x 12 inch opal glass supported at a 45° angle, illuminated from within by lights controlled by a rheostat. A rest on which to align the transparencies so that they may be properly superimposed is required.

Procedure

There are three steps in the procedure: the selection and preparation of the test portion, its immersion in the medium, and the matching of the vegetable matter.

For a 10 x 12 inch immersion vessel, a 60 gram sample of scoured wool is the maximum that can be conveniently examined. Not less than 10 small random portions are taken from the material to be tested and the composite sample is weighed. The small portions are spread out by hand and dropped into the liquid in the immersion vessel in such a manner as to cover the entire bottom of the vessel with an approximately uniform mat. Clumps of vegetable matter in any portion must be dispersed before immersion. When the content of vegetable matter in the material is high, it is advisable to make several determinations with smaller samples in order that the vegetable matter may be spread out sufficiently to permit of easy matching.

Entrapped air bubbles in the immersed wool interfere with the determination. To avoid such a condition it is best to drop the wool gently into the liquid previously placed in the vessel; as the wool sinks the air is completely displaced. The cover glass is then pressed down over the wool and fastened. The layer of compressed wool is generally about ½ inch thick. The vegetable matter in the sample is now clearly visible and ready for matching with the standard photographs.

By matching is meant the reproduction, by means of the standard photographs, of the appearance of the immersed sample as to type, size, and number of particles of vegetable matter. Matching is done in steps. First, the various types of vegetable matter present are identified by inspection. Starting with a particular type, the operator classifies the particles as to size by comparison with the various sizes represented in the several series of standards of the same type, and selects a particular size as the one to be matched. Various combinations of plates from the proper series of standards are viewed on the illuminator until one is found which appears to have the same number of particles as the sample. After an approximate match has thus been made, the corresponding particles in the sample and on the standard plates are counted and the match is made more exact by such changes in the combination of plates as are required. Without removing previously selected combinations from the standards illuminator, the operator repeats these operations for other sizes and types. This is done until all the types and sizes present in the sample have been correctly matched by a number of superimposed plates.

The total weight of vegetable matter in the sample is the sum of the weights

represented by each of the standard plates required in the final match.

PREPARATION OF STANDARD PLATES

A standard plate is a photograph of a known weight of a specific type and size of vegetable matter distributed in a random manner in the immersion vessel. The weight of a particle of vegetable matter is influenced by its content of moisture, extractable material, and mineral matter. Hence, it is essential that vegetable matter be brought to some standard condition with regard to these variables before it is weighed for the preparation of a standard plate. This condition must be consistent with the other phases of a complete analysis. For example, if the moisture, extractives, and ash contents of a lot of scoured wool are determined separately, the standards used for estimating bur content should represent weights of vegetable matter free of moisture, extractives, and ash in order that overlapping corrections for these factors may be avoided.

The standard plates used in this laboratory were prepared in the following manner. Suitable quantities of each type and size of vegetable matter were separated by hand from scoured wools and carefully picked free of all adhering fibers. The fiber-free material was washed with hot soap solution, dried, extracted in a Soxhlet with carbon tetrachloride followed by alcohol, and dried at 110° C. to constant weight. It was then allowed to regain moisture until it was in equilibrium with the atmosphere, and reweighed to determine its moisture content. Ash determinations were made on representative portions of each type and size of vegetable matter. From the known moisture and ash contents the quantities of air-dry vegetable matter corresponding to the weights of bone-dry, ash-free material listed below was calculated, and these quantities were used in the preparation of the photographic standards.

The respective quantities of vegetable matter were spread out at random in the empty immersion vessel, illuminated from below, and photographed. Transparent glass prints of exactly the same size as the immersion vessel were prepared and these constituted the standard plates.

The weights of bone-dry, ash-free, extractives-free vegetable matter represented by the eight plates in each series were as follows: 0.050, 0.100, 0.200, 0.200, 0.500, 1.000, 2.000, and 4.000 grams, respectively. The range of a series was 8 grams in steps of 50 milligrams.

Common Types of Vegetable Matter

The variety of vegetable matter present in wool is as wide as the variety of vegetation found on the sheep ranges of the world. Some interesting studies of such material have been made on the basis of plants found growing near woolen mills. Hundreds of species from dozens of genera are listed[5,6]. Nevertheless, the vast bulk of vegetable matter commonly found in wool is composed chiefly of a comparatively small group of plant burs and particles, so that a relatively small number of series of photographic standards suffices for routine determinations. The most common types are the following:

(1) Spiral bur, Trefoil bur, or bur clover (genus Medicago), is the type occurring most frequently and the one most difficult to remove mechanically. It may be present in scoured wool to the extent of 30 per cent. The burs vary in size and weight. The large burs are 5 to 7 mm. in diameter and have an average weight of 14 mg. The medium burs are 3.5 to 5 mm. in diameter, average weight 10 mg. The small burs are 2 to 3.5 mm. in diameter, average weight 5 mg.

(2) Shive, which is the term commonly applied to small plant fragments and slivers, is encountered very frequently. It has been found to comprise as much as 6 per cent of some scoured wools. Shives are very light, usually under 1 mg. per particle, so that a very large number may constitute only a small percentage by weight.

(3) Cockle bur or Bathurst bur, (*genus Xanthium*) is the next in order of frequency of occurrence. While it may occur in very high percentages in some raw wools, it falls out comparatively readily in picking and scouring, and therefore rarely exceeds 5 per cent in scoured wools. The largest size, called the Noogoora bur, ranging up to 25 mm. and having a very thorny body firmly entangled in the wool, is seldom encountered. The medium size burs are 10 to 12 mm. long, average weight 63 mgs. The small burs are 7 to 10 mm. long, average weight 41 mg.

(4) Sandbur, *(genus Cenchrus)*, occurs occasionally in some wools. It has a few long sharp rigid spines, does not fall out of the wool easily, and rarely exceeds 4 per cent in scoured wools. They do not occur in clumps. Those found in wools range from 7 to 11 mm. in size, and average 17 mg. each.

(5) Barley grass *(genus Hordeum)* is occasionally found in small quantities. These rarely occur in quantities over 1 per cent. Measuring 8 to 12 mm., they average 5 mg. each.

(6) Paraguyan bur, or sheep bur, *(genus Acanthospermum)*, has been found in a few wools. It is a fairly smooth bur, with a few longitudinal corrugations, and falls out of the wool easily, so that scoured wools seldom contain as much as 2 per cent. The burs are 5 to 7 mm. long, average weight 15 mg.

While many other types of vegetable matter have been photographed for standards series in this laboratory, it has been found unnecessary to use them in routine work. Twigs, pieces of wood, straw, various seeds, and even sheep tick pupa have been photographed. Usually, these materials are easily removed during routine laboratory operations and are seldom found in scoured wool.

PRECISION AND ACCURACY OF THE METHOD

The precision of the method has been studied on three 1-pound lots of scoured wool having widely different contents of vegetable matter.

The universe standard deviations of determinations on a 60-gram portion of scoured wool (from duplicate determinations by 4 operators on four portions from each lot) ranged from 0.09 per cent to 0.45 per cent increasing with the concentration of vegetable matter, as shown in Table I.

Sampling precision is a factor in any method of determination of vegetable matter. It is not a function of the test method proper, except in the sense that the larger the test portion which can be dealt with by the test method, the smaller will be the error introduced by sampling. In this study each test portion weighed 60 grams and consisted of at least ten small handfuls taken at random from the 1-pound lot. The universe standard deviation of sampling was found to be slightly higher than that of testing.

A tabulation of the universe standard deviations of testing and of sampling, and of the combined effects of the two, is given in Table I.

TABLE I
Precision of Testing and Sampling

Concentration of Vegetable Matter Percent	*Standard deviation, σ, of*		
	Testing Percent	*Sampling Percent*	*Sampling and testing Percent*
1	0.09	0.11	0.14
4	0.18	0.20	0.27
9	0.45	0.70	0.84

To study the accuracy of the test method the vegetable matter in the test portion at each level was removed by hand and weighed. These weights were compared with those previously found by test. The difference in each case was found to be about 0.1 per cent. The method is therefore considered accurate within the limits of precision.

DISCUSSION

The method may be applied to any material the particle impurities of which are to be examined and the optical properties of which can be duplicated by a suitable liquid. Fibrous materials such as wool, cotton, rayon and other natural and syn-

thetic fibers, and crystalline materials of various kinds, may be examined by this method. For some purposes it may be sufficient to count the number of foreign particles observed, as in wool top, whereas for other purposes it may be useful also to identify the particles and note their size. If suitable standard photographs are available, it is possible to perform an indirect weighing of the particles. The scope of this method, for qualitative and approximately quantitative examination of particle impurities, is quite wide, the application to the determination of vegetable matter in wool being only one of many possibilities.

There are several limitations to the application of this method. Difficulties in achieving transparency are encountered in cases where the material has more than one index of refraction or is strongly colored. Difficulties in achieving good quantitative determinations are encountered when the number of types of impurities, the number of sizes of each type present, or the total number of particles is large.

The achievement of transparency of a material by immersion in a liquid requires that the optical properties be matched closely. A material which is not homogeneous or which has more than one index of refraction, such as wool, cannot be made perfectly transparent. In such cases, almost perfect transparency, with just a trace of haze, is achieved by close matching of the average refractive index, provided the two indices do not differ by much and the material is not in too thick a layer.

A material having an easily matched refractive index but possessing a strong color will filter out a large part of the light, thereby remaining visible by virtue of the difference in color between the material and the medium (or the light source) and obscuring any substance within or behind it. This difficulty may be overcome by the use of a liquid having the same color, both in shade and intensity, as well as the same refractive index. Alternative methods of overcoming the difficulty are the use of a light filter having the same absorption spectrum as the colored material, or a light source of a wave-length which is not absorbed by the material being studied.

The use of the method of indirect weighing by means of standard photographs is restricted to those impurities for which standards have been prepared. Where a large variety of impurities is encountered, a correspondingly large number of series of standards must be available. The most serious difficulty in this method of indirect weighing is encountered in those types of impurities which vary greatly in particle size. For spherical particles, an increase in diameter of only 10 per cent corresponds to an increase in volume and weight of 33 per cent; a diameter increase of 30 per cent more than doubles the weight. It is, therefore, essential to have standards representing the various sizes commonly encountered within each type of impurity, and to match the sizes carefully.

While each type of vegetable matter in wool naturally occurs in a variety of sizes, it is usually found possible to match the common sizes by the use of no more than three series of standards for any one types.

Securing a test portion which will adequately represent the sample is often difficult. Obviously, the larger the test portion, the more representative it is likely to be. However, sixty grams of wool is about as much as a 10 in. x 12 in. immersion vessel will accommodate and still give a clear field for examination. If the material is unusually non-uniform, more than one 60-gram portion may be required for a satisfactory determination. Furthermore, if such an unusually high concentration of vegetable matter is encountered that it is necessary to reduce the size of the test portion to 40 or 30 grams, each such portion is less representative than a 60-gram portion would be. Consequently, very high concentrations of vegetable matter require more determinations because of two factors: first, high concentrations are usually less uniformly distributed and require larger samples for proper representation; second, the high concentration necessitates smaller portions for accurate matching.

CONCLUSION

The method offers a means for rapid laboratory examination of various materials for particle impurities, and for estimation of weights of such particles. The accuracy of the determinations is dependent on correct identification and matching of size and number of particles with properly prepared standards.

ACKNOWLEDGMENT

The authors are indebted to Dr. Ivan M. Johnston of the Gray Herbarium, Harvard University, for identifying the various types of vegetable matter mentioned in this paper.

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Preservation of Cordage

(Continued from Page 374)

ment as well as to determine whether, under conditions favoring severe microbiological attack, there was any substantial difference in the rot resistance of untreated cordage made from different types of fiber. The fibers chosen for test were manila, sisal, "wartime," North American hemp and cotton in the form of 3/8-inch diameter 3-ply twisted rope. One half of the length of each coil of rope was given a rot and water resistant treatment using a compound which had been found to give satisfactory results with cotton rope for tentage requirements. Specimens of the untreated and treated rope were leached in running water at approximately 20° C. for 24 hours and air dried. They were then tested for rot resistance by the standard soil burial test referred to above (1).

The data for the various samples when tested against the requirements of the specification already referred to, and also the data for breaking strength after burial, are given in Table II.

ANALYSIS OF RESULTS

It will be noted that in the case of cotton the strength of the sample was increased as a result of the preservative treatment (1375 lb. to 1525 lb.), while in the case of the hemp there was a substantial loss in strength (1570 lb. to 1150 lb.). In the case of the other fibers the differences in strength of untreated and treated samples were hardly significant. However, in all cases the original breaking strengths of the treated samples were well above the requirements of the specification.

The results of the burial test on the untreated ropes indicate that the untreated cotton and "wartime" samples lost a greater percentage of their original strength than did the hemp, manila or sisal samples. The descending order of deterioration was: cotton, "wartime," sisal, hemp and manila. This is in line with the common belief regarding the lasting qualities of ropes made from these fibers.

In the case of the treated samples it will be noted that the maximum loss in breaking strength shown by the buried samples was 12 per cent (for manila) compared with a loss of 65 per cent to 94 per cent for the untreated ropes exposed to the same conditions. This is striking evidence of the effectiveness of copper naphthenate as a rotproofer.

It will be noted that the specification requires the presence in the treated rope

TABLE 2

Analysis of Cotton, Hemp, Manila, Sisal and Wartime Ropes untreated and treated, 3/8-inch Diameter

Test	COTTON		HEMP		MANILA		SISAL		WARTIME	
	Untreated	*Treated*	*Untreated*	*Treated*	*Untreated*	*Treated*	*Untreated*	*Treated*	*Untreated*	*Treated*
Weight (feet/lb.) ..	23.7	21.1	25.4	20.9	28.7	25.5	27.1	25.4	27.1	24.1
Ply	3		3		3		3		3	
Strands in each ply.			6		4		4		4	
Length of 10 turns (inches)	9.6		13		12.1		12		13.4	
Water Repellency—increase in weight (%)	27.1	19.8	61.1	23.0	46.8	24.6	40.0	32.7	61.7	27.6
Extractable matter (%)		12.7		20.4		19.1		20.6		20.2
Copper content (%)* unleached sample.		0.53		0.66		0.41		0.38		0.47
leached sample ..		0.49		0.64		0.23		0.26		0.46
Breaking Strength (lb) (7") leached, original .	1375	1525	1570	1150	1640	1570	1195	1010	1670	1650
leached, buried 2 weeks	100	1450	510	1205	580	1385	270	1050	100	1475
Breaking Strength Loss on Burial (%)	93	5	67	0	65	12	77	0	94	11
Shrinkage after soaking in water for 24 hr. (%).....	2.1	1.6		4.0		1.7		3.5		3.5

*The apparent loss of copper as a result of leaching shown by the manila and sisal ropes is not due to solubility in water of the copper naphthenate but to the loss of some of the oily constituents of the proofing together with the copper naphthenate dissolved in them.

of copper naphthenate rotproofer in a quantity sufficient to give not less than 0.5 per cent copper in the treated rope. In the present series of experiments the same proofing compound was used on all the ropes and this, owing to the lower pick-up of the compound by the hard fiber ropes (manila and sisal), accounts for their lower copper content. In actual practice the copper content of the treating compound would have to be adjusted to the pick-up of a given type of rope so as to obtain the required copper content in the treated rope. It will be obvious that in the case of the manila and sisal samples in which the content of copper was considerably less than this figure, protection against rotting can be imparted by the presence of copper contents of around 0.2 per cent. The reason for the larger amount specified is to provide a margin of safety against possible loss by leaching on weathering, and this practice is one generally employed in specifications requiring the presence of a rotproofer.

QUALITIES OF ROTPROOFING AGENTS

The efficacy of various types of rotproofers containing copper as the active ingredient has recently been the subject of a considerable amount of investigation. The principal copper compounds covered are the naphthenate, oleate, oleo-stearate, tallate (made from the fatty acids derived from "tall oil," a product of the processing of southern pine), carbonate, as well as the cuprammonium treatment widely used on heavy cotton fabrics in England. Of the above treatments the cuprammonium treatment is unsuitable for use with cordage, and in any case is not available in Canada. The copper oleate, oleo-stearate and tallate treatments appear in general to be inferior to copper naphthenate (2) (3). This seems to be largely due to the fact that the naphthenic acids are themselves toxic to micro-organisms whereas the fatty acids used in the manufacture of the oleate, oleo-stearate and tallate are susceptible to attack. Thus, any breakdown of the rotproofer in the latter cases gives fatty acid residues which are not only devoid of protective value against micro-organisms but rather serve as a medium for their growth.

ACKNOWLEDGMENT

The authors wish to express their thanks to the Plymouth Cordage Company, Doon Twines Limited and Drummondville Cotton Company for the samples of cordage, and to Drummondville Cotton Company for carrying out the treatments; also to Miss G. R. F. Rose and E. Emond of these laboratories for assistance in carrying out this investigation.

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The Annual

PROCESSING

REVIEW

NUMBER

will appear

DECEMBER 4, 1944

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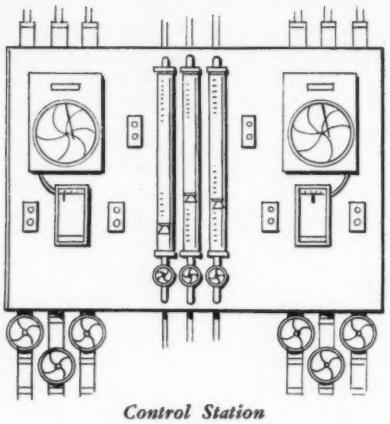
This issue will contain the papers presented at the Annual Meeting to be held in Atlantic City in October.

Continuous Peroxide Bleaching—

(Concluded from Page 368)

laboratory or blueprint stage, are expected to bring this objective within the field of practical possibility. Some of the newer developments are mentioned briefly below.

The level of cloth in the J must be held at some predetermined point in order to obtain the required treating time. In many situations, it is difficult to see into the top of the chute. Various schemes for the using of sight glasses, including those with photoelectric attachments, have been only partially successful. Work is in progress on improved electronic methods of indicating cloth level, which will make it possible for the operator to gain this information by a glance at his instrument panel.



Control Station

The chemical concentration in each saturator must be held at some predetermined value. In the case of the caustic and acid saturators this may be accomplished by conductivity meters which may be located at a central control point.

CONCLUSION

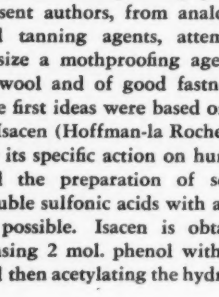
It is hoped that this discussion will aid in a broader understanding of the "how" and "why" of the new continuous peroxide bleaching systems. It should be realized that an entire wet processing scheme is involved, requiring careful choice of plan, and integration of all the parts, if maximum advantage is to be obtained. The peroxide manufacturers, who have developed this system, stand ready to furnish full information and advice for each particular case. It is up to the individual mill management to decide whether the system is advantageous in its particular case and to assure itself that the simplest and most effective system is chosen.

(Part III will appear in the next issue)

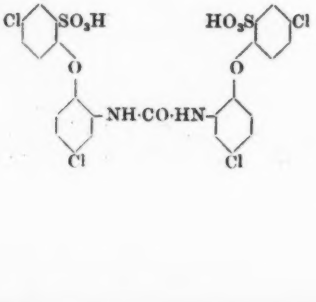
• ABSTRACTS FROM CONTEMPORARY JOURNALS •

NEW MOTHPROOFING AGENTS CONTAINING SULPHONIC GROUPS. P. Lauger, *Helv. Chim. Acta*, 1944, 27, 71-87. Through *J. Soc. Dyers & Col.*, July, 1944.

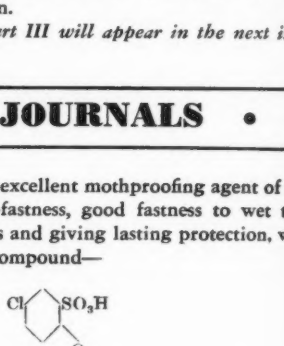
Developments in mothproofing agents are surveyed from the discovery of Eulan F (By.) in 1927 to the present day, with particular reference to other essential requirements, e.g. fastness to light, washing, milling, ironing, etc., and relations between chemical constitution, substantivity and mothproofing properties. The present authors, from analogy with dyes and tanning agents, attempted to synthesize a mothproofing agent substantive to wool and of good fastness properties. The first ideas were based on the synthesis of Isacen (Hoffman-la Roche), well known for its specific action on human intestines, and the preparation of selected water-soluble sulfonic acids with as high toxicity as possible. Isacen is obtained by condensing 2 mol. phenol with 1 mol. isatin and then acetylating the hydroxyl groups—



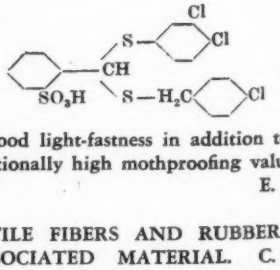
Similar derivatives, possessing the requisite fastness to light and washing, were prepared from isatin-5-sulfonic acid and *o*- or *p*-chlorophenol, 2:4-dichlorophenol or 6-chloro-*m*-cresol, but their mothproofing value was not sufficiently high. These products are somewhat similar in structure to Eulan N (cf. *J. Soc. Dyers & Col.*, 1939, 59, 219), while comparison with the *leuco*-compound of Eriochrome Cyanine R (*Colour Index*, No. 722) indicates that both types of products are colorless dyes of the triphenylmethane series. Attempts to increase the mothproofing activity by using the *N*-benzyl derivative of isatin, with and without chlorine atoms and a sulfonic group in the benzyl residue, were unsuccessful, but these experiments indicated that substantivity of mothproofing agents is as desirable as actual mothproofing value, and the relations which exist between substantivity and chemical constitution in the case of dyes are applicable to colorless substances with mothproofing properties. Thus, on the basis that substantivity in direct cotton dyes is related to the presence of certain bridges, as in diaminostilbene, diaminodiphenylurea, diaminodiphenylthiourea, a diaminobenzoylarylamide, and diaminodiphenyltriazine, a number of products have been synthesized containing the urea residue, a toxic dichlorodiphenyl ether and sulfonic groups in positions known to have the maximum influence on substantivity. Of these, the compound—



is an excellent mothproofing agent of high light-fastness, good fastness to wet treatments and giving lasting protection, while the compound—



is Mitin FF (Gy.). It has very good fastness to light, washing, milling, seawater, perspiration and other wet treatments, and is non-toxic to human beings. Finally, investigations with a number of sulfur-containing compounds, e.g. sulfoxides, sulfones, mercaptals and mercaptols, have indicated that the condensation product of benzaldehyde-*o*-sulfonic acid with 1 mol. 3:4 dichlorothiophenol and 1 mol. 4-chlorobenzylmercaptan—



has good light-fastness in addition to an exceptionally high mothproofing value.

E. L.

TEXTILE FIBERS AND RUBBER AS ASSOCIATED MATERIAL. C. M. Blow and W. Knight. *J. Textile Inst.*, 1944, 35, P7-18. Through *J. Soc. Dyers & Col.*, July, 1944.

Part I—A composite rubber material

combining a high degree of tensile strength with comparatively low extensibility and with flexibility can be produced by incorporating a textile yarn or fabric as reinforcement external to the rubber mixing. Cotton has by far the widest use, owing to its excellent affinity for rubber leading to a high degree of adhesion. A modern lorry tire contains 48 lb. rubber in 7 differently compounded mixings, 13 lb. cotton in 6 distinct types of fabric and 5 lb. steel wire. Recently, viscose rayon has been used as an alternative to cotton, and a tire cord made from 275/120 high tenacity viscose rayon yarn has a dry strength equal to that of cotton at normal temperature and 40 per cent greater at 140° C., a temperature which may arise under continuous running conditions, when tires containing viscose rayon are an advantage. Rubber transmission belting is made from closely woven cotton duck by impregnating with plastic unvulcanized rubber, slitting into strips (warpways), folding into the required number of plies, stretching and vulcanizing under tension. It has a high coefficient of friction and is superior to leather belting under difficult atmospheric conditions, e.g. in steam or acid fumes. The V-rope belt, now a serious rival to the chain drive, has, as its main element, multiple wraps of a single cord, usually cotton, and has the characteristics of tire cord. Other uses include conveyor and elevator belting and rubber-lined hose.

Part II—Rubber may be used as a textile-finishing agent, e.g. the application of rubber latex to carpet backing improves the anchorage of the pile, thus replacing sizing. It may also be used as the sole means of anchoring the pile to a hessian backing, and similarly for backing plushes. Another use is in the laying of surface fibers, e.g. in jute packs for food and wool. Paper in which latex is incorporated in pulping has crease-resistant properties and increased wet strength. Impregnation of finished paper with a specially compounded rubber latex followed by a varnish or synthetic leather finish yields artificial leathers. Rubber latex may also be used for imparting stiffness to felts and for binding coarse fibers, e.g. horse hair, to produce upholstery stuffing. In applying rubber latex to textiles three difficulties must be overcome, viz. (1) the fiber must be rendered wettable by the latex, (2) the charge of the rubber particles and the fibers must be opposite, and (3) the formation of a rubbery skin or film must be avoided. The application to wool should aim at preserving the desirable qualities of the wool as far as possible. This is best achieved by using a cationic soap to make a positively charged latex which is taken up by the wool as a particulate film. Wool fibers so treated have less tendency to slip over one another, and in carpets and plushes shedding of fibers is eliminated; in knitted and woven fabrics of loose structure wearing properties are improved and the formation of surface pills is considerably reduced.

F. F. E.

REGAIN IN WOOL. N. W. Gillam. *Textile J. of Australia,* 1943, 18, 324, 358, 394; 1944, 18, 427-430, 466-469. Through *J. Soc. Dyers & Col.,* July, 1944.

The rate of absorption of moisture by wool increases with increase of both temperature and R. H., even though a higher temperature gives a lower equilibrium regain. The rate of change of regain is affected by the wool quality, fine wool responding more readily than coarse wool, and lowered by the presence of oil, residual acid from carbonizing or dyeing, or dye. Oiled wool has a higher equilibrium regain than unoiled wool at high humidities, whereas dyed wool has a lower value. Changes in the type of oil had some effect, but no significant change was found by varying the percentage of oil. The presence of soap or wool grease increases the rate of change of regain. Under atmospheric conditions equilibrium is reached in about 2-3 hr.

F. F. E.

PRINTING RAYON VELVET AND PLUSH. S. Wigfall. *Text. Manuf.,* 1944, 70, 79, 81. Through *J. Soc. Dyers & Col.,* July, 1944.

Rayon velvets are block printed when the pile is $< \frac{3}{4}$ in. long; if the pile is longer, block printing does not reach to the base of the pile and stencil printing is employed, using zinc plate stencils and applying the printing paste with a stiff brush. Before printing, the goods are desized and, if necessary, scoured. Long-piled goods also undergo "pile splitting," i.e. the spinning twist is removed from the pile in order to make it look full and furry. Pile splitting and desizing are often carried out simultaneously, the fabrics being treated on a star wheel machine or winch for 30 min. in warm water containing, if necessary, a little desizing agent. The goods must not be treated in rope form or "cracks" may result, a fault extremely difficult to remove. Soiled goods are desized and partly pile split, the latter process being completed only towards the end of the scour. Pile splitting is controlled by periodically inspecting the tufts during desizing; when the tufts are opened about halfway, cold water is run in until the goods are lukewarm, the detergent added and the liquor brought to the necessary level. Soap and a little ammonia are the usual detergents. Scouring is usually carried out at 40° C. in order to avoid distortion of the pile, although badly soiled goods may need scouring at 45° C. The volume of liquor should be such that the goods float, thus preventing the folds from pressing upon one another and avoiding the danger of distorting the pile; 10 min. normally suffices for proper cleansing. Cooling down must be gradual, e.g. a batch of six 30-yd. pieces requires at least 30 min. Pieces which are quite cold may be hydroextracted in rope form, or a suction machine may be used; some firms use a fly-winch made of closely spaced rails which is rotated at speed in a detachable cover. The pieces are next "dressed" or "carded," i.e. they are stretched tightly on a frame and a "jack" (a piece of board with brass card clothing on one side and a short handle) is passed repeatedly through the pile until all tangles and locks are eliminated. The jack is seldom used on short-piled velvets, which are lightly treated with a soft brush of the same width as the fabric. The brushing must always be endways, with the last stroke in the direction of the lie of the pile. The fabric is kept on the frame until completely dry and before removal is beaten with canes to raise the pile. Cheap velvets are treated similarly, using an apparatus placed at the end of a pin-chain stenter; the pile is treated first with a roller covered with card clothing or bristles, and then the back of the fabric is treated with a rapidly revolving flagellator. The tips of the pile are levelled off by one passage through a single-cutter cropping machine.

Block printing is usually carried out with a paste made from condensed water, glycerol, direct cotton dye, sodium phosphate and thickener, added in that order. The printed pieces are steamed for 30 min. at 1 atm. pressure and they must be efficiently shrouded by anti-drip covers. Basic dyes are used for very bright shades.

Dyeing for discharge styles is carried out on the winch below b.p., since viscose rayon becomes distinctly plastic at high temperatures and there is danger of pile distortion. The Formosul discharge is usually thickened with British gum, glycerol being used when the fabric is dried before steaming.

With cellulose acetate rayon pile fabrics, gum Senegal and gum Arabic are used as thickeners for direct prints, and British gum and gum tragacanth for discharge prints. When direct cotton dyes are used, caustic soda is added to the printing paste in order to produce superficial saponification of the rayon; about 1 gal. 75° Tw. caustic soda is used per 8 gal. British gum thickener. After printing, the goods are steamed at 1 atm. pressure for 30 min., great care being taken to avoid the slightest rise in the internal pressure of the steamer, which might blind the cellulose acetate rayon. Where the pile is on the inside of the cloth at the turnbacks of the folds coming at the ends of the frame, there should be no pressure, as

cellulose acetate rayon becomes so plastic when steamed that any distortion of the pile under these conditions may become permanent. Printing pastes applied to long-pile cellulose acetate rayon fabrics by hand brushing should not be too thick, or the pile may become clogged and dry in a distorted state. It is best to flagellate cellulose acetate rayon pile fabric before the paste has had time to dry and then leave it on the frame to dry before steaming. With basic dyes the use of tannic acid gives richer shades and improved fastness to light and washing; the printed pieces are steamed for 30 min. without pressure and then run in a lukewarm bath containing a little tartar emetic. Dispersed cellulose acetate rayon dyes for printing are available in paste form; they need at least 60 min. steaming.

C. O. C.

EFFECT OF pH ON THE ADSORPTION OF DYES BY WOOL AND COTTON. V. Y. Kurbatov and A. S. Moiseev. *Trudy Leningrad. Krasnoznamen. Khim.-Tekhnol. Inst. im Leningrad, Soveta,* 1940, 9, 88-112; through *Chem. Abs.,* 1943, 37, 3607 and *J. Soc. Dyers & Col.,* July, 1944.

Three simultaneous reactions occur in dyeing, viz. (1) adsorption of the dye solution by the micelles of the fibers according to the law of distribution and accompanied by fiber swelling; (2) combination of the dye by ion exchange with the crystalline polyions of the fiber; and (3) possible combination through co-ordinate links with ions or parts of the crystaline polyions. With dyes containing strong ionogenic groups (SO_3), maximum adsorption occurs at a very low *p*H. Dyes containing many cation groups show a maximum at intermediate *p*H and this maximum becomes more marked with increase in the number of cation groups. Dyes containing anion groups other than sulfonic groups reach maximum adsorption at intermediate *p*H, this maximum becoming greater the stronger the anion groups and the greater their number. The fiber consists of crystalline polyamphions which, in contact with water, undergo hydration accompanied by hydrolysis of —$COONH_2$— and —CONH— links. Dyes are amphoteric and exhibit the isoelectric state better in an acid medium the greater the number of anion groups in the dye. The introduction of anion groups, e.g. sulfonic and nitro-groups, increases the number of negative charges. The introduction of weak anion groups changes the ionic state of the dye ion without changing the number of charges. The isoelectric state is spread out over a considerable *p*H range; on approaching this isoelectric state the size of the polyions increases and hydrolysis of the fiber takes place with greater difficulty. The adsorption of the dye by the fiber is chiefly an ionic reaction which deviates more from the state of equilibrium the larger the number of charges and polyions in the fiber and the dye, and the greater their difference from each other for each component.

F. F. E.

ANALYSIS OF DYES. K. D. Shcherbachev. *Org. Chem. Ind. (U.S.S.R.),* 1940, 7, 577-580; through *Chem. Abs.,* 1943, 37, 6464 and *J. Soc. Dyers & Col.,* July, 1944.

Excess aryl *peri*-acids are determined with an accuracy of 1-1.5 per cent by extracting with *iso*amyl alcohol, coupling the extract with diazotized *a*-naphthylamine-3: 6-disulfonic acid and measuring the dye formed colorimetrically. Nitrobenzene impurity in aniline is determined by a potentiometric method based on the fact that the polarization of a hydrogen electrode is proportional to the nitrobenzene content. The moisture content of dyes can be rapidly determined by measuring the dielectric constant.

F. F. E.

TRADE NOTES • NEW PRODUCTS

OBITUARY

J. RIVERS ADAMS

JAMES RIVERS ADAMS, Captain, U. S. Marine Corps Reserve was killed in action on Guam, according to advices just received from Southwest Pacific Headquarters. Captain Adams was born in Lynchburg, Va., July 12, 1910. A graduate

J. Rivers Adams

of Virginia Military Institute in the Class of 1931, he was associated with Westvaco Chlorine Products Corporation during his entire business life, joining Westvaco at its South Charleston plant immediately upon leaving college. Captain Adams became manager of Westvaco's Carteret plant in 1936 and for the two years prior to joining the Marine Corps was Manager of Sales.

GEORGE A. STEVENOT

GEORGE A. STEVENOT, well known in the dyestuff and chemical industry died on August 12th at the Englewood (N. J.) Hospital. He was in his 71st year.

Funeral services were held on August 15th at the Grisel Funeral Home in Palisades Park, N. J.

Mr. Stevenot's home was in Palisades, N. J. He is survived by his widow, a son, a daughter, and a brother.

WILLIAM H. KEARNS

WILLIAM H. KEARNS, secretary of the National Silk Dyeing Company in Paterson until his retirement 12 years ago, died on August 15th at his home in Paterson. He was 82 years old.

Mr. Kearns was born in Brooklyn and had lived in Paterson since 1892. He founded the Kearns Brothers Silk Dyeing Company which later merged with other firms to form the National Silk Dyeing Company. He was a founder and former president of the Silk Dyers Association of Paterson and served for many years on the Paterson School Board. During the first World War he was fuel administrator in Paterson.

He is survived by his widow, four daughters and five sons.

• CHEMISTS TO TALK AT NAT'L IND. CHEM. CONFERENCE

Contributions of industrial chemical engineering to the petroleum, synthetic rubber and other industries will be revealed by noted authorities at the National Industrial Chemical Conference to be held in conjunction with the third biennial National Chemical Exposition at the Coliseum in Chicago, Ill., Nov. 15 to 19.

In a symposium on "The Future of Metals in Post War," Dr. L. B. Grant of the Dow Chemical Company, Midland, Michigan, will talk on magnesium; Dr. J. V. Faragher of the Aluminum Company of America, Pittsburgh, Pa., will discuss aluminum, and Mr. John Mitchell, metallurgical engineer of the Carnegie-Illinois Steel Company, Pittsburgh, Pa., will speak on new steel alloys.

Acceptances have been received from Dr. Robert D. Coghill of the Northern

Regional Laboratory, U. S. Department of Agriculture, Peoria, Ill., to talk on "Penicillin Production," and from Dr. C. R. Addinall of Merck & Company, Rahway, N. J., who will have "Vitamin Production" as his subject.

Also among the speakers will be Dr. George Granger Brown, Professor of Chemical Engineering at the University of Michigan, who is President of the American Institute of Chemical Engineers.

• WPB REPORT

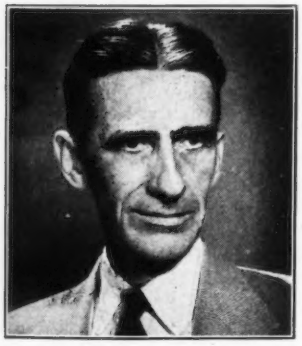
By an amendment to General Allocation Order M-300, reported recently by the War Production Board, sodium ferrocyanide, potassium ferrocyanide, potassium ferricyanide and potassium-sodium ferricyanide chemicals used in the photographic and textile industries will be placed under allocation effective September 1. They have been controlled by directive for the last two months.

The small-order exemption per person per month is: sodium ferrocyanide, 720 lbs.; potassium ferrocyanide, 100 lbs.; potassium ferricyanide, 100 lbs.; potassium-sodium ferricyanide, 370 lbs.

Officials of WPB's Chemicals Bureau said that the chemicals had been placed under allocation at the request of the industry advisory committee. All of these chemicals are in short supply.

• GEIGY APPOINTMENT

Charles J. Dumas, formerly manager of the insecticide and fungicide department of Rohm & Haas, has been appointed manager of the insecticide division of Geigy Co., Inc. After obtaining entomological training at St. Lawrence University, Mr. Dumas spent twelve years in commercial farm management and for a time was attached to the U. S. Department of Agriculture. He later operated the specialties division of the Sinclair Refining Company. The wide-spread need by the armed forces for GNB-A-DDT, and the revelation of the possibilities for many insecticidal compounds covered by that patent, have increased Geigy Company's activities in the insecticidal field.



Charles J. Dumas

• REJOINS REFINED PRODUCTS COMPANY

Affiliated with Refined Products Company in 1940, T. LaRue Courson left in 1942 to become Chief Chemical Engineer for Production in the U. S. Rubber Company organization which started and operated the U. S. Pennsylvania Ordnance Works, a high explosive plant. Mr. Courson remained in this capacity until March, 1944, when he became assistant to the Production Superintendent of the Kankakee Ordnance Works, which position he held until his recent return to Refined Products Company.

T. LaRue Courson

• NATIONAL CARBON COMPANY BOOKLET

Just released by National Carbon Company, 30 E. 42nd St., New York City, is their new Catalog Section M-8802. This booklet sets forth several charts and tables covering the heat conductivity and the physical and chemical properties of carbon, graphite and "Karbate" materials. It contains a great many illustrations and drawings indicating the versatility of these materials in the design and execution of an extensive variety of heating and cooling units.

• SOUND MOVIE AVAILABLE

An all-color sound movie telling for the first time the interesting life story of the largest plastic family in industry, the cellulose family, is now available for exhibition, according to an announcement by Hercules Powder Company's Cellulose Products Department.

Titled "Careers for Cellulose," the 16-mm. film traces the story of cellulose from the cotton fields of the South, through the Hercules chemical plants where cotton linters are transformed into cellulose derivatives, to testing laboratories and finally to manufacturing plants where end products are made.

Technical details showing the manufacturing of cellulose, cellulose acetate, nitrocellulose, and ethyl cellulose, bases for plastics, lacquers, film, rayon, and many other articles, were filmed in Hercules chemical plants at Hopewell, Va., and Parlin, N. J.

Hercules Experiment Station in Wilmington, Del., is the locale for other parts of the film that show research chemists testing the many compounds and how new fields for cellulose are constantly being opened.

In addition to demonstrating the wide possibilities of cellulose materials in a variety of industries, the film pictures many applications for cellulose in newer plastic developments. Pictures of the cellulose derivatives being turned into various plastic products were filmed in several industrial plants.

Prints of the film, which run for approximately forty minutes, are available without cost for exhibition. The exhibitor, however, must provide the 16-mm. sound projector and the operator.

• ENTERS NAVY

Paul C. Duggan, technician for Celanese Corp. of America, has been commissioned as a lieutenant (j.g.) in the U. S. Naval Reserve and is now stationed at Fort Schuyler, New York.

• ELECTED GENERAL SALES MANAGER

Leon P. Brick, associated with Onyx Oil & Chemical Company as technical and sales representative for the company in New York, Pennsylvania and the Southern States for eleven years and Assistant General Sales Manager for the past seven years, was elected General Sales Manager, effective August 1, 1944.

Leon P. Brick

• NEW HOOKER PRODUCT

Hooker Electrochemical Company, Niagara Falls, New York, announce that Trichlorcumene (Isopropyl Trichlorbenzene) is being produced in pilot plant quanti-

ties by the company. Trichlorcumene is a colorless liquid with a mild aromatic odor. It is a mixture of Trichlorcumene isomers and is insoluble in water and soluble in alcohol, ether and most common solvents. It is said to be highly stable, resistant to oxidation and hydrolysis and compatible with many types of plastics.

Suggested Uses: Hydraulic fluid, transformer and dielectric fluids, anti-freeze additive for hydraulic, dielectric and heat transfer fluids; solvent for fats, oils, waxes, coal tar dyes, asphalts; solvent, diluent, and plasticizer for protective coating and insulating compositions; extractant for phenols, etc., from liquids such as waste waters; ingredient of insecticidal compositions, paint and varnish removers, paints, solvents and plastic compositions.

• BURKART-SCHIER BOOKLET

The current series of Burkart-Schier Chemical Company advertisements depicting the role of chemistry in the development of textiles will continue for several months. Upon completion the entire series will be published by Burkart-Schier in booklet form.

The interest of dyers and chemists is evidenced by the receipt of over 500 requests for copies.

To be sure of receiving your copy of this booklet, fill out the coupon at the bottom of the Burkart-Schier advertisement found on page XXXIII of this issue and mail it to the company at Chattanooga, Tenn.

• NEW PLASTIC CEMENT

Pliastic Cement is the name of a new synthetic resin adhesive announced by Paisley Products, Inc., Chicago and New York. In appearance it is a soft white fluid cement that may be used in its natural state or reduced with water. Application is by brush, gumming machine, spreader, dipping, flow or spray gun. The manufacturer states that Pliastic is compounded of selected resin bases with complex non-resin materials to yield a tough, pliable, continuous film capable of joining many combinations of materials.

The Pliastic film, when dry, is a semi-transparent, glossy, flexible coating with excellent heat sealing properties. When used in the liquid state for bonding materials it can be applied to one or both surfaces, the speed of setting being dependent upon the porosity of the materials used. According to the company Pliastic is being used in many industrial operations as a replacement for rubber latex.

• JOINS FOXBORO SALES FORCE

The Foxboro Company, manufacturers of industrial instruments for measurement and control, announces the addition of Paul Torre to the staff of sales engineers covering the New England territory.

Mr. Torre brings to his new work a background of useful experience covering nearly 25 years, many of them devoted to technology and production control, especially in pulp and paper mills. His headquarters will be at the New England District Office of The Foxboro Company, at Foxboro, Mass.

• HERCULES BOOK ON NITROCELLULOSE

A basic textbook on the properties and uses of soluble nitrocellulose, base for plastics, lacquers, coated textiles and many other products, has been published by Hercules Powder Company's Cellulose Products Department.

Beginning with a discussion of the history of nitrocellulose, the book contains a section on properties which includes chapters on the manufacture, types, solubility, viscosity and other pertinent information on the unusual properties of nitrocellulose so useful in so many different industries.

A result of many years of research work by Hercules, the company believes this is the most complete compilation of technical information on soluble nitrocellulose available to industry.

• NEW DIVISION OF INTERCHEMICAL CORPORATION

Effective August 7, 1944 Standard Coated Products Corporation became a division of Interchemical Corporation, to be known as Standard Coated Products Division of Interchemical Corporation. There will be no change in operations or in personnel.

• WOONSOCKET TESTING HOUSE REMOVAL

The Woonsocket Testing House of the United States Testing Company is now located at new headquarters—59 Social Street, Woonsocket, R. I.

The Testing Company has moved its Woonsocket branch to larger quarters to efficiently handle the increased volume of testing in New England. The new laboratories are established with sufficient floor space to handle transit shipments of yarn as well as the quantity testing of woolen and worsted yarn.

Special laboratories have been built to handle diversified physical and chemical tests on fabrics and other materials and these laboratories are complete with up-to-the-minute conditioning equipment.

Recent British Patents

Abstracted by the Society of Dyers and Colourists

Reprinted from their Journal, July, 1944

Dyeing Cellulose Acetate and Compositions for Use Therein

Atlantic Rayon Corpn. *B.P.* 559,991.

Secondary cellulose acetate rayon is dyed by an immersion process by means of a solution of an acid dye, e.g. Wool Fast Blue BLA extra new (*Color Index*, No. 833), Azo Rubinol 3GP (S.), Alizarine Cyanine Green GHA extra (G.D.C.) (cf. *Color Index*, No. 1078), Fast Silk Yellow G (Gy.) or Milling Red SWG (*Color Index*, No. 430), in an aqueous solution of an organic solvent for the cellulose acetate, particularly an organic acid, e.g. formic acid and acetic acid, with or without sulfuric acid. The solution has *p*H below 1.4, and its concentration is between its "threshold concentration" for the particular duration and temperature of the dyeing operation and either its "critical delustering concentration" or "critical swelling concentration."

Thus, in an example, the dyebath for package dyeing contains water (3,000 lb.), 85 per cent formic acid (333.3 lb.), 84 per cent acetic acid (333.3 lb.), 32.5° Tw. sulfuric acid (333.3 lb.) and the dyes, the yarn being dyed at 80° F. for 30 min., the temperature then being raised slowly to 125° F. and dyeing continued for 90 min.

E. L.

Dyeing Nylon

Courtaulds Ltd. and C. C. Wilcock. *B. P.* 558,586.

The affinity of nylon for direct cotton dyes, cellulose acetate rayon dyes and acid dyes is increased by treating the material at a temperature of at least 65° C., before or during dyeing, with an aqueous solution containing not more than 70 per cent of an aliphatic non-solvent for nylon, e.g. a monohydric alcohol, or mono-or di-alkyl ether of glycol, particularly *n*-butyl alcohol or amyl alcohol.

Thus in one example, nylon yarn is dyed for 30 min. at 90° C. with 6 per cent Chlorazol Blue B (*Color Index*, No. 406) in presence of 5 per cent of 80 per cent acetic acid and 4 c.c. *n*-butyl alcohol per 100 c.c. dyeliquor. A heavy navy blue shade is obtained compared with a light blue shade in absence of *n*-butyl alcohol. When cellulose acetate rayon dyes or acid dyes are to be used, the nylon is pretreated with 4 c.c. *n*-butyl alcohol per 100 c.c. liquor at 90° C. for 10 min., washed in cold water and then dyed at a lower temperature, e.g. 40°c., for 1 hr.

E. L.

SANDOZ PRESENTS *The color achievement of the month*

Saddle Beige **BY AMERICAN WOOLEN COMPANY**

For *chic* in town or country, Sandoz presents another color hit of the season . . . smart saddle beige, created for Rosenblum by American Woolen Co.

Cooperating with many a leader in textiles, Sandoz research has developed many a dye which now adds lustre to admired fashions throughout the Americas.

For the feminine wardrobe, Sandoz offers a full range of Acid colors . . . level dyeing, well suited for piece dyeing, and extremely fast to light and wear. These include such colors as Xylene Light Yellow 2 GP (Pat.) . . . the patented Alizarine Light Blue 4 GL and Violet 2 RC or Azo Rubinole 3 GP (Pat.), all exclusive Sandoz developments.

For men's wear, a distinguished group of Sandoz milling colors is at your service . . . fast to wet processing, applicable to wool raw stock, worsted tops and yarn dyeing in package machines. Among them are the patented Brilliant Alizarine Milling Blues BL, G and SL, uniquely fast to light *and* fulling.

Also, for men's wear, investigate Sandoz Metomega Chrome Colors in a complete metachrome range. Their ease of application has saved as much as 50% in boiling time.

Sandoz application laboratories are maintained in New York, Boston, Charlotte, Los Angeles and Toronto; stocks are carried in those cities. Other Sandoz branches: in Chicago, Paterson, and Providence.

Another "achievement of the month" from Sandoz' color hit parade —next month. Watch for it.

SANDOZ CHEMICAL WORKS, INC., 61 VAN DAM STREET, NEW YORK 13, N. Y.

SANDOZ *thinks ahead with textiles*

SANDOZ

Continuous Supplies . . .

CALL FOR MOUNTING DOLLARS

Official U. S. Coast Guard photo

Official U. S. Marine Corps photo

. . . . STEP UP YOUR PAY ROLL PLAN!

War is a continuous job.

Ever-widening, ever-advancing fighting fronts call for a never-ending flow of manpower and materiel—*financed by a continuous flow of money.*

Your responsibility as top management increases with the mounting tide of battle. You've been entrusted with two major responsibilities—steadily maintained production, and steadily maintained War Bond Sales through your Pay Roll Savings Plan.

So keep this one salient fact before you at all times: *The backbone of our vital war financing operation is your Pay Roll Savings Plan.*

Your job is to keep it constantly revitalized. See to it that not a single new or old employee is left unchecked. See to it that your Team Captains solicit everyone for regular week-in and week-out subscriptions. And raise all percentage figures wherever possible.

Don't underestimate the importance of this task. This marginal group represents a potential total sales increase of 25% to 30% on all Pay Roll Plans.

Constant vigilance, in a quiet way, is necessary to keep your Pay Roll Savings at an all-time high. Don't ease up—*until the War is won!*

The Treasury Department acknowledges with appreciation the publication of this message by:

AMERICAN DYESTUFF REPORTER

Back the Attack!

SELL MORE THAN BEFORE!

This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council

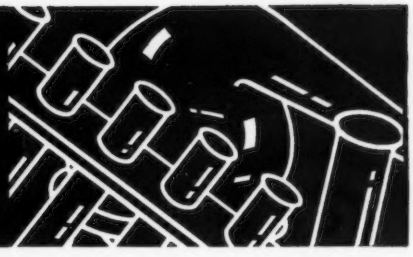
BIXAMINE BROWN BRLL

- Direct
- Homogeneous
- Level Dyeing
- Excellent light fastness

BICK & CO., Inc.

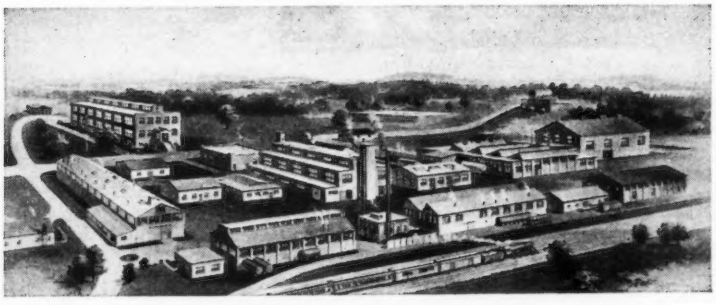
Manufacturing Chemists

Reading, Pa. Charlotte, N. C.



NYANZA

ANILINE & ALIZARINE COLORS
TEXTILE CHEMICALS



FACTORY AT ASHLAND, MASSACHUSETTS

NYANZA COLOR & CHEMICAL COMPANY, Inc.

215 WATER STREET NEW YORK CITY

FACTORIES:

CHEMICAL MANUFACTURING CO., ASHLAND, MASS. • NEW BRUNSWICK CHEMICAL CO., NEWARK, N. J.

BRANCHES:

Ashland, Massachusetts

549 West Randolph St., Chicago, Ill. • 635 Drexel Bldg., Philadelphia, Pa. • 115 S.W. Fourth Ave., Portland, Ore.
2657 Magnolia Ave., Knoxville, Tenn. • 304 E. Moorehead St., Charlotte, N. C.

CANADIAN AGENTS:

Chemicals Alberta Smith Limited, 123 Liberty St., Toronto, Canada

• Classified Advertisements •

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $6.25 per column inch or less per insertion.

POSITION WANTED: I have a thorough knowledge of warp, skein, and package dyeing, all types of colors. Am anxious to locate a suitable job with a large dyehouse in the South. Employed at present but desire a change. Accustomed to handling one hundred thousand pounds per week, including mercerization. Married, have two children, draft status 1-A-H. Box No. 578.

MANUFACTURERS AGENT AVAILABLE: Reliable party would like dyestuff and textile chemical account in South on commission basis. Excellent contacts among southern dyeing and finishing trade. Familiar with application angle as well as sales. For details write Box 583.

POSITION WANTED: Chemist. Female, graduate work in chemistry. Six years of experience in textile and mercantile testing, including three years as laboratory director, desires position with future offering opportunities for research. Box 585.

POSITION WANTED: Dyer, 33 years old, 14 years experience, cotton, rayon and acetate crepe piece goods. Draft exempt, can go anywhere. Box 587.

WANTED: MANUFACTURING CHEMIST: Manufacturer of textile chemical specialties situated in Metropolitan area offers an unusual opportunity for a man capable of supervising processing of present formulations, and to develop new ones. He must have a good knowledge of rayon textile printing gums, all types of finishes, detergents, etc. Only a man answering these qualifications will be considered. Box 588.

WANTED: Experienced chemist for development work in textile finishes, including printing materials, weatherproofing and special resin finishes. Must have good record of experience. Excellent opportunity and attractive salary for qualified man. State fully qualifications and experience. Our employees know of this advertisement. Write Box 589.

SALESMAN WANTED: With following in textile field, by large manufacturer of sizings and chemicals. State experience, age, salary desired. Box 590.

WANTED: Back numbers Journal of the Textile Institute. Volume 32 (1941), Nos. 8 through 12. Volume 34 (1943), all numbers. Prefer unbound. Box 591.

NOTE

Essential employees need release statement. Employees who are to be hired for critical occupations need release statement and U. S. E. S. consent.

ATCOWET RX—An ideal leveling agent for even dyeing—gives brighter shades, swells and softens fabrics.

ATCOSOFT #440—A surface active substantive finish—gives soft, supple finish, without harshness, on all fabrics.

Write now for complete details on these ATCO products.

Atlantic Chemical Co.,

PLANT AND MAIN OFFICE : CENTERDALE, RHODE ISLAND
BRANCH OFFICE : PATERSON, NEW JERSEY

LOGWOOD BLACK

for

LEATHER · WOOL
SILK · COTTON
FUR · HAIR · PIGMENTS

1862 Y

DEPENDABLE SOURCE OF SUPPLY
ECONOMICAL - RELIABLE

Tannic Acid • Sumac • Quercitron
Fustic • Gambier • Flavine

THE J. S. YOUNG COMPANY
BALTIMORE, MD.

HASTINGS IRISOL R S

COLOUR INDEX 1073

Hastings Irisol RS is a level dyeing acid violet of outstanding fastness to light. It is recommended for the dyeing of ladies' dress goods, carpet yarn, knitting yarn, upholstery material, hats, etc.

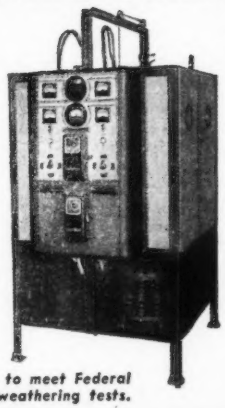
ZINSSER & COMPANY, Inc.
ESTABLISHED 1897
Manufacturing Chemists
HASTINGS-ON-HUDSON NEW YORK

WEATHERING TEST FOR TEXTILES

Weathering effects of sunlight, rain, heavy dew and thermal shock reproduced in the laboratory at an accelerated rate that reduces years of actual weathering to a few days of testing in the —

ATLAS TWIN-ARC WEATHER-OMETER

The Twin-Arc Weather-Ometer has full automatic control of light and water periods. The Atlas Cycle Timer unit can be set to reproduce any combination of weathering conditions. A direct reading thermal regulator, automatic shut-off switch and a running time meter is included on the control panel. After setting exposure cycle on the control panel the Weather-Ometer is safe to be left in continuous operation over night without attention except to replace carbons once in 24 hours.



The Atlas Weather-Ometer is required to meet Federal Specifications demanding accelerated weathering tests.

ATLAS ELECTRIC DEVICES COMPANY
361 W. Superior Street, Chicago 10, Illinois
Originators and sole manufacturers for over a quarter of a century. . . Weather-Ometers, Launder-Ometers, Fade-Ometers are the accepted standard accelerated testing machines all over the world.

THE STANDARD DE-SIZING AGENT

RAPIDASE

Dependable, speedy and economical de-sizing . . . Our technical staff always at your service.

● *for cottons rayons and mixed goods*

WALLERSTEIN CO., INC.
180 MADISON AVENUE, NEW YORK

How Would You Like to Talk About Your Products to More Than 4800 Chemists, Dyers and Finishers At One Time?

★ The Ninth Annual Processing Review Number of the AMERICAN DYESTUFF REPORTER will be published on December 4th, to permit the publication **in one issue,** of all papers which are being prepared by the various local sections in competition for the Inter-Sectional Contest Award sponsored by the Association. Also included in this issue, as a regular feature, will be information on new machinery, dyestuffs, textile chemicals and other equipment for the textile wet processing field developed during 1944.

★ The publication of these original papers will be of great interest to the chemist, dyer and finisher, as the subjects will be pertinent to today's problems. The value of display advertising in this issue is obvious.

★ As a manufacturer of products which are important in the production of fabrics for war, you should certainly request advertising space reservations in this issue. Due to government restrictions, we are limited in the amount of paper we use, so early reservations are advisable.

AMERICAN DYESTUFF REPORTER
440 FOURTH AVE., NEW YORK 16

QUALITY RICHMOND PRODUCTS

ROSALAMINE

The better Scouring and Dyeing Aid for Cottons, Rayons, etc.

Fine for "Boiling Out"
Two Types

Yellow, which contains an organic chrome compound for conserving dyestuff.
White—without chrome.

Complete Details upon request

At Your Service

RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
153-155 RICHMOND STREET, PHILADELPHIA 25, PA.

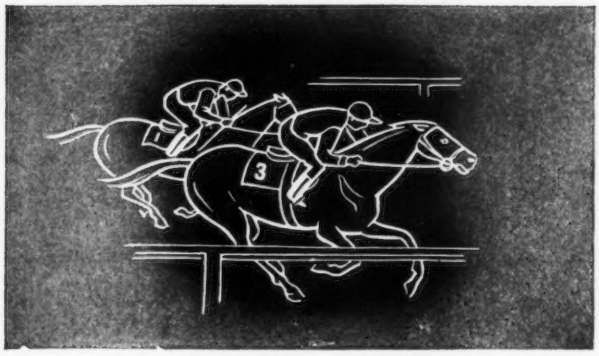
MANUFACTURERS SINCE 1896

CHEMICALS AND SOAP PRODUCTS

for the Textile Industry

NAMICO
T. M. REG. U.S. PAT. OFF.

NATIONAL MILLING & CHEMICAL COMPANY
4601 Nixon St., Philadelphia, Penna.



PERFORMANCE

The technical excellence of Zurnoil Textile Chemicals has been proved by over 60 years' practical use in many of the nation's most important textile mills. Whether for processing and finished woven goods or knitted wear, every Zurnoil Product gives peak performance for the particular use intended. Zurnoil continuing research always keeps pace with the introduction of new chemicals, with the new techniques of the textile industry, with the new fibres and improved finishes of today and tomorrow. . . . Why not try a Zurnoil Product for your current processing or finishing problem? Write today.

SPECIALTIES FOR
Scouring
Stripping
Penetrating
Finishing
OILS FOR ALL REQUIREMENTS

Zurnoil
TEXTILE CHEMICALS

O. F. ZURN COMPANY
PHILADELPHIA 32, PA.
KNOXVILLE, TENN. · HAMILTON, ONT., CANADA

ARKANSAS Products

Serve Dependably

★

FUNGICIDE: A mildew proofer made in various types to meet all government specifications.

ARKO FIRE RETARDANT: For flame-proofing uniform cloth, felt and all types of rayon and cotton fabrics including theatrical drapes.

***AQUAROL:** A water repellent for uniforms, overcoatings and other military fabrics; also all civilian garment cloth.

***PARAMINE:** A cation active softener for processing cotton and rayon cloth to obtain a soft, smooth, pleasing fininsh.

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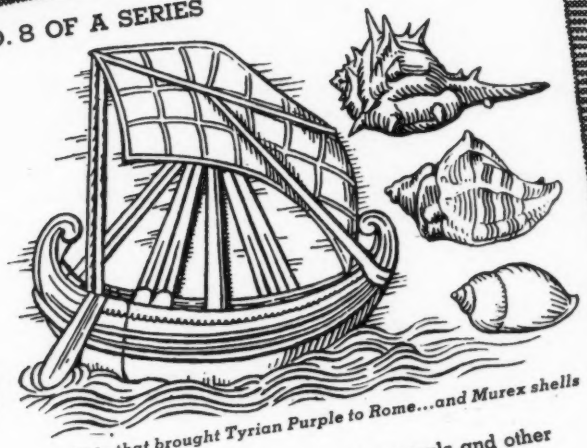

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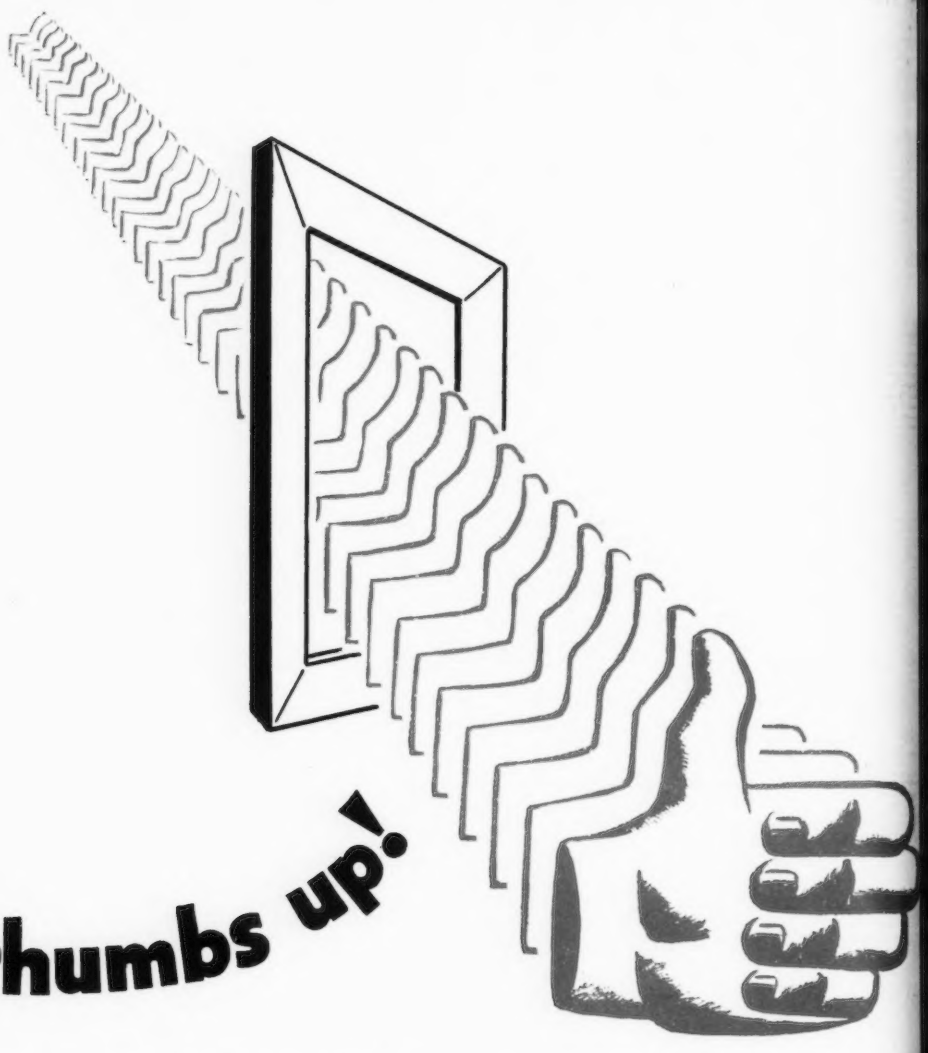

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